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The central topic of how institutions of higher education solve facilities need problems which result from rapidly expanding enrollments was examined by a conference on facility utilization and the planning of instructional facilities. The proceedings include the major papers delivered, which varied from a broad view of the problems to an analysis of some specific elements of planning for expansion. Also included in the presentations were--(1) a case study, (2) a look to the future, and (3) information on resources available from campus planners and architects. A discussion summary is included for the symposium on campus planning, and the reactions to the major papers are recorded from a panel discussion. A comprehensive bibliography on planning higher education facilities is included. (HH)

The Planning and Utilization of Instructional Facilities

Conference Proceedings
August 8-9, 1960

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HERBERT R. HENGST
Editor

Center for the Study of Higher Education
Michigan State University • East Lansing

Proceedings of an Invitational Conference sponsored by the Center for the study of Higher Education and the Educational Facilities Laboratories, Incorporated, Ford Foundation

THE PLANNING AND UTILIZATION OF INSTRUCTIONAL FACILITIES

Proceedings of an
Invitational Conference
sponsored by the

Center for the Study of Higher Education
Michigan State University

and the

Educational Facilities Laboratory, Incorporated

of the Ford Foundation

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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August 8-9, 1960
East Lansing, Michigan

Edited by
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PREFACE

This publication contains the recorded proceedings of a conference directed at throwing light on a most pertinent question: how do institutions of higher education deal with the problem of facilities needs which results from the rapidly expanding demands for their services? The Educational Facilities Laboratories Incorporated, of the Ford Foundation has demonstrated a real interest in the problem of the use and planning of educational facilities. It made possible a study of utilization and planning practices as they related to instructional space in small colleges. This study was conducted by the Center for the Study of Higher Education of Michigan State University Recognizing that the interest in efficiency of utilization was widespread, the two agencies determined to make available a forum through which the issue could be examined. Thus was developed an invitational conference, "The Planning and Utilization of Instructional Facilities in Institutions of Higher Education," the proceedings of which appear in the following pages

The conference included participants from colleges, universities and interested agencies. Each had been invited as a representative of his institution. The conferees heard presentations which aired a broad view of the problem (see papers of Russell and Rork), analysis of some specific elements of the problem (Jamrich), a case study (DeWitt), some resources available from campus planners and architects (Lautner and Brubaker), and a look to the future (Hereford). Opportunity for general exchange of ideas was also provided through scheduled panel discussions and informal across-the-table sessions at mealtime.

The staff members of the Center wish to recognize and acknowledge the assistance of the many people who made the Conference both possible and successful: Dr. Harold Gores, President, Educational Facilities Laboratories, Incorporated; Dean Clifford E. Erickson, College of Education, Michigan State University; the exhibitors -- Eberle M. Smith Associates, Detroit, Michigan State University Campus Planning Office, the Architects Collaborative of Cambridge, Massachusetts, Perkins and Will, Chicago, and Neutra and Alexander, Los Angeles; Deje Television of Michigan City, Indiana; the speakers, whose names appear in the Procedings; and Dr. Sheldon Cherney, Continuing Education Service, Michigan State University, who served as conference coordinator.

Herbert R. Hengst
Editor

John X. Jamrich
Conference Director

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WELCOME TO THE DELEGATES

John X. Jamrich, Chairman of the Conference

It is my distinct, personal pleasure to call to order this conference on the use and planning of instructional facilities. For Michigan State University, the Center for the Study of Higher Education, and for myself personally, I want to extend a warm greeting to you all. It is my sincere hope that this conference, sponsored by the Center for the study of Higher Education and the Educational Facilities Laboratories, will provide the opportunity for us to focus attention on the variety of problems facing institutions of higher education as they plan for the future. The program has been arranged with this objective in mind. But equally as important is the opportunity for each one of us to meet and talk over these problems with our colleagues from other institutions. Michigan State University is happy to have you on its campus.

Speaking on behalf of Michigan State University this morning, we have the Dean of the College of Education, Dr. Clifford Erickson. Dean Erickson.

Clifford E. Erickson, Dean, College of Education, Michigan State University

We are delighted to have you here, for this very important conference on instructional facilities. We are indebted to Harold Gores and the Educational Facilities Laboratories of the Ford Foundation for the where-with-all and some of the incentive for this conference.

I talked with President Hannah just a few minutes ago. He is taking a few days vacation time up north, and he asked me to express for him his regret at not being able to be here and his hope that you will enjoy meeting on the campus. He sends to you his very best wishes.

We are particularly happy to have such a distinguished crowd from all over the United States gather here and join with us in a study of this most important problem. College and university facilities in the next few years are going to expand tremendously. We are going to need the best brains and the best economy and the best planning possible. I'm delighted to see such good friends as Arch Shaw who have so much to contribute to this kind of development.

If there is anything we can do to make your stay more pleasant, please don't hesitate to tell some of the people who have badges on indicating that they are hosts. If you would like to visit more of the campus, or if there are people you would like to see, or if there is anything else we can do for you, please don't hesitate to let us know. Again, on behalf of the University, may I say how delighted we are to have you here.

The Honorable G. Mennen Williams, Governor of Michigan

It is an honor, indeed, and a privilege, to welcome you to Michigan on behalf of the people of our state. I feel a very special competence to welcome this group because for years I've practiced my own special brand of efficiency in trying to become mindful of the universities and their facilities in order to make it possible for me to know something about the many problems that confront the State of Michigan and more lately in order to assist myself as the Governor to perform the role that Governors seem to be interested in today, and that is also to give some leadership in world affairs. I must say that even more recently, I have been having an interesting experience in trying to advise one of the presidential candidates, -- I won't say which one because I understand this is a non-political meeting, -- to facilitate the flow of knowledge and experience and advice from the universities into the whole political arena. Certainly, this kind of marriage of politics and the academy is something which is essential to the well-being of our nation. But enough of that, or I may forget my non-political role.

Lansing does play host to many educational conferences and it's been my pleasure to greet a number of them but it's not often, as Dean Erickson has said, that we get a virtual Who's Who of educational America as we have today.

Dr. Werhner Von Braun has observed, "For years, we've been talking too much about hardware and too little about filling the vat of knowledge. We've been taking from that vat for years and putting little or nothing back in. Now we're scraping the bottom." Well, looking around this room, I know that if you people have anyting to say about it, we will never reach the bottom. But I think Dr. Von Braun's point is well taken. America has not yet completely absorbed the wisdom of Thomas Jefferson's observation; "If a nation expects to be ignorant and strong, it expects what never was and never will be." I think we in the 1960's might add, that if a nation expects to be ignorant and strong, it expects what neither will nor can be. It's especially gratifying to talk to the educational administrators because you combine an appreciation of the importance of a solid, substantive, profound, educational experience with the practical business of getting things done. The very subject of your conference, "The Planning and Utilization of Instructional Facilities," is a key to your indispensable role as brokers between fact and theory. It is my contention that we need more of your kind of spirit and ability in thepolitical world as I've already adverted to. We need this ability to translate projections into realities. For instance, countless responsible agencies which have investigated the matter. recommend that this nation as least double its investment in education. The recent Whitehouse Conference on Children and Youth recommended an increase in financial support of education from the present three percent of the gross national product to ten percent. The Rockefeller Report, the President's Science Advisory Committee, the Committee for the Whitehouse Conference on Education. they all said words to this effect. Even allowing for considerably greater efficiency in the use of educational funds, doubling our current annual investment in education is probably a minimal rather than an extravagant goal. Believe me, with you, I feel that we must make every effort to take advantage of new methods and tools to make education more efficient, but I'm still convinced that we must build around the able teacher and that we're going to need more rather than less of them. Incidentally, I do hope that we're going to be able to reward our teachers more adequately and let me say that I make this statement even after the conference that we had at the Governors Conference especially to study how we can utilize more fully, as you are studying, all of the various teaching aids, of television, of the new learning machines, as well as perhaps changing our curriculum over the period of the year, and the greater utilization of buildings. I'm quite convinced that in the final analysis we find, -- and here I'm preaching to the experts, -- that the teacher is still going to be at the core and that perhaps instead of being an exclusive unit, the teacher is going to become the chief of a team, a team utilizing not only numerous persons but numerous mechanical and other kinds of devices. It will be in the heart and the head of that teacher to so utilize all of these facilities so that the student will have an even greater and richer opportunity than in the past. And of course, you as administrators, will continue to have the challenging task of seeing to it that the teachers are so organized that they will be the most productive that they possibly can be.

While I recognize that this meeting has quite properly taken our educational spectrum to include the private as well as the public schools of education in order to maintain the freedom that we know, I want to say just a word about state financing of educational programs because many states have run up against the problems of severe limitations of the state treasuries. I think it's not well known that in the past ten years state expenditures for education have increased from almost one hundred to three hundred percent. Strangely enough, for all of the publicity that we've gotten, every single state in the union except one has had a greater percentage increase than Michigan. I'm not proud of that. I just state it as a fact. We had a ninety-seven percent increase and only Illinois had a lesser increase than ours. Now, I state this to indicate that despite the problem of inflation, the states have made a very real effort to cope with their problems. The fact that their efforts have been insufficient in the area of education as all of us know, only shows how tremendous this challenge is. I'd like to point out that also in this period when we've gone up from a hundred to three hundred percent, that local and state debts have jumped two hundred and eleven percent, so that we can see we have been straining at the leash and that in spite of our increase in taxes so often, that our debts have increased by a greater extent. I want to come to the necessity of Federal aid because this is a current problem and it must be related to the fact that while our states have been making this real effort, while state and local debts have jumped two hundred and eleven percent, there's been only about a ten percent increase in the Federal debt. In other words, while I think the states must continue to make an extreme effort, I think they've been doing fairly well at least in the area of education. But also, Uncle Sam has an obligation because today the Federal Government pays only four cents out of every educational dollar. You know of the other arguments for Federal aid, those related to unequal ability of the various states. And here I just want to purge myself because I'm always accused of shooting barbs at the southern states for one reason or other. I want to point out that I recognize while the southern states haven't been able to make the educational effort in the terms of the quality of education, the number of people educated, as many of the northern states have. this isn't due to any lack of effort on their part. Many of the southern states are investing a greater percentage of their income than the northern states but their income, unfortunately, isn't great enough so that even with that greater percentage, the product is insufficient.

Well, I think that this is one of the vital challenges our age. I recognize that we must point to great efficiency as you are considering here today, but the challenge is so large and we've met it so inadequately, that even with the greater efficiency, we are going to have to make a greater investment. That's why at this time, I seek not only to welcome you here, which I do most heartily, but perhaps even preach to you because I do feel that all of us have to pool our efforts in order to get our American society conscious of the nature of the challenge and inspired to do what has to be done.

Democracy depends, as Oliver Wendell Holmes pointed out, on the market-place of ideas. We are on the threshold of an historic political campaign in which the quality of the ideas put forth and adopted by the candidates of both parties has implications for every man, woman and child on this planet. So, I say to you, regardless of your political affilliations, give America the benefit of your wisdom, your know-how, your pragmatism, and partake in American politics, for as Alfred North Whitehead has pointed out, "In the conditions of modern life, the rule is absolute. The race which does not value trained intelligence is doomed." I'm sure that your contributions will be vitally important to see that we don't have that dreadful fate before us.

Thank you very much for this opportunity and I certainly wish you all success in your deliberations. I am sure that they will make an important contribution to the life of America. Thank you. God bless you.

THE OVERALL PROBLEMS OF USE AND PLANNING OF COLLEGE AND UNIVERSITY INSTRUCTIONAL FACILITIES

John Dale Russell

When John Jamrich wrote to me about this, he said mine was to be a keynote speech. He wrote about the time they were planning the National Conventions and, of course, the word keynote had a very particular significance at that time. I don't know that I'm competent to do any real keynote job here, but the keynote speaker, I suppose, should necessarily take care of some "arousements." That's hardly my strength, but at least we can open up some of the problems of the use and planning of college and university instructional facilities.

The Problem

The acute necessity for consideration of such problems in these days arises from the appraisal that has been made of the probable needs for capital outlay to take care of the rapidly increasing college enrollments that we're very certain are going to come through our doors in the next two decades. This calculation can be made very simply by dividing the present total investment in fiscal plant by the number of students, thus arriving at an amount per student and then multiplying that by the expected numbers of additional students. You will get somewhat different projections by that method but that is one of the simple ones. This assumes that the present rates of utilization will continue and, if you multiply by what is approximately the present investment per student, somewhere between four and five thousand dollars, you will get a figure in almost any state that is just truly shocking. A good many people feel it's hardly reasonable to expect that within the next ten, fifteen or twenty years as much money will be found as this calculation will seem to indicate. It certainly looks as if, in the next fifteen years. we will probably have to provide as much money for higher education as has been spent in this country up to the present time. This is a dramatic way of putting it without figuring it out in dollars and cents with too many ciphers behind your dollar sign. Even this is probably an understatement because the figures do not take into account the probable rise in the cost of construction. We can't foresee that. but we know it always has risen and we can only presume that it will continue in the future.

Also. the fact must be considered that we shall have to take care of a great deal of obsolescence during this period besides the additions to the plant needed to take care of new enrollments. Consequently the figure, however you come out with it, is something that will leave tax payers, legislators. and donors to private institutions, almost in a state of shock. I'm pessimistic about finding that much money. Maybe you are not. But at least using our present methods of approach to the people who provide the money, I just don't think we'll get it. It seems unlikely that that much capital outlay can be obtained during the next fifteen or twenty years.

There remain just two alternatives: either the number of young people who will be admitted to college must be restricted so that the anticipated growth in enrollments doesn't occur: or some method or methods must be found to care for the education of college students with less generous use of floor area than has been the practice in the past. The former alternative I am sure is decidely unacceptable to the great majority of Americans. There may be individual institutions that will decide to restrict enrollments and not to participate in the increased service to young people, but such a decision only throws a greater burden on the ones that do not decide to do that. Therefore, most of the existing institutions will have to expand, most of them up to some theoretical limit at least of some maximum effective size. Also, new institutions are being created to care for the demands, the new demands for higher education.

But the expansion of existing institutions and the creation of new institutions do not contribute directly to the problem of solving the capital outlay needs because they also will require enormous amounts of money for the new plant. Therefore, the demands for better utilization of fiscal plant space are, in my judgment, imperative. Furthermore, I would say that while I'm pessimistic about getting the money for the capital outlay, I think one of the most advantageous approaches to those who provide funds is to show that the present plants are used as economically as possible. I've been impressed with the fact that even members of the legislature can be convinced of the need for capital outlay when that need is shown to be based upon careful studies and careful administration of existing facilities. It is extremely important for educational leaders to tackle and to solve the utilization problem. Otherwise, I'm convinced, solutions that are probably educationally unacceptable may be proposed and put into effect by agencies such as state legislatures, governing boards of private institutions, and various other agencies that supply the funds for higher education. It is incumbent, in my judgment, upon educational leaders to demonstrate that they are doing everything humanly possible to solve this problem.

Operating Funds. The capital funds that are needed to provide the additional plant facilities that will be required are not the only consideration. It is not only a matter of capital funds for the new construction, for the provision of a new building is not by any means the end. Every addition to physical plant space entails an additional and continuing burden on the current operating budget of the institution. You can figure that out in terms of dollars per student if you want to. The recent Big Ten-California study shows very clearly that the cost of operating the plant, the total cost, is most closely related to the number of square feet of floor space. Not a very startling conclusion, I should say, but none-the-less one that should give pause to those who are constantly increasing the floor space. It means simply that as long as that space is in use, there is an added burden on the current operating budget. This drain may be reduced somewhat by increasing the effectiveness of the use of plant space, that is by providing less space per student that we have been accustomed to in the past.

The funds available for colleges and universities in their current operating budgets, in my judgment, are most urgently needed to provide improvements in faculty salaries. I was very pleased to hear the Governor give support to that point of view.

In my judgment, the number one need today is not plant, it's faculty. Better faculty salaries are imperative if we are to get the faculty members that we need in sufficient number and in good quality. Every dollar that can be saved for this purpose, that is, the improvement of faculty sallaries, in my judgment, should be sought, whether it's by reducing the amount of capital outlay for new plant construction or by reducing the plant operating costs through somewhat of a restraint upon the additions to the plant.

Thus, both from the points of view of the capital outlay needs and from the point of view of the current operating expenditures which we face in the future, the necessity for the improvement in the utilization and in the planning of plant facilities is completely justified.

Instructional Space. The topic of the conference today is limited to instructional space. I'm defining it rather narrowly to include only classrooms, instructional laboratories, and possibly a few other sorts of rooms that are designed primarily for students to meet regularly with faculty members in organized class sessions. I'd like to include faculty offices in this discussion because they certainly are a form of instructional space, but in our usual tabulations of instructional space, they have not been included. Also, we don't have reliable data as yet upon the utilization of faculty offices, although I think they are a very effective facility within an educational institution. The kind of plant facilities that are customarily classified as instructional space comprise a very large fraction of the total non-residential space in the typical college or university. My figure for that runs around fifty percent. This is taken from the study that Hollis, of the Office of Education, did some ten years ago in which he found, on square footage basis, approximately that figure. The new California-Big Ten study uses quite a different figure. I'm a little surprised at what they come out with because in the range of their fourteen campuses, they found anywhere from fourteen percent to thirty-eight percent of the area devoted to instructional space, considerably less than half but still more than for almost any other purpose in the majority of the institutions.

This conference wisely calls attention to two aspects of the problem of instructional space. One, relating to the utilization of existing space and other to the planning of new plant facilities. The planning of new facilities is much the more exciting aspect of this problem. Perhaps the opportunity for the improvement of utilization of the present plant space can be equally rewarding economically. It certainly requires a great deal of administrative attention.

Space Utilization Studies

Other speakers on the program are scheduled to deal rather intensively with some of the aspects of plant planning. My attention is therefore going to be centered mainly on the problems of improved utilization of existing space and only indirectly with the problem of plant planning. The studies of plant space. instructional space utilization, have been widely made in the colleges and universities of the United States. I always like to call attention to the fact that while there are many of these studies made, very few of them are published. As a matter of fact, some of them are very secret documents and will not be released under any circumstances, and when you see the results of the studies, you can understand why it might at times be embarrassing to release these data. I would call your attention to the work that the Registrar's Association has done in this field through the publication of the manual on space utilization studies. It was prepared in order that institutions might have a more or less uniform standardized procedure for making such studies and also in order that there might be norms of performance established.

It is very embarrassing sometimes to point out how many periods per week the average classrooms are in use, particularly if you compare that to how many periods it might be in use. So, the device was used in this manual of setting up norms in percentiles so that instead of saying, the seats in our classrooms are only warmed about one fourth of the possible periods in the day, or in the week, you can say we're using our space better than sixty-two and a half percent of all the institutions in the country. Now, that becomes a much more palatable way of reporting the figures on utilization. That publication has resulted I think in some improvement in the publicity given to the studies.

Jim Doi has recently compiled more current norms based upon very recently conducted studies. Incidentally, he found that since the manual has been published there have been, apparently a great many more studies of this kind made. Curiously, the norms haven't changed much. It gives you a good deal of confidence in the stability of these norms. These are now available so that you may compare your own. You may make the study yourself and compare it with other institutions in your own category if you wish.

I would like to make one other comment, too, by way of passing. The research in this field, and it's very, very limited, has to the best of my knowledge, demonstrated no relationship whatever between the effectiveness of student learning in an institution and the expansiveness of the plant space. That is, as far as we have any evidence we do not know that twice as many square feet per student produces any better educational results than half as many, to put it very simply. Perhaps we should have more research on this point because it is not extensive. It is not conclusive but within the limits of all the observations we've been able to make, there is no increase in effectiveness of the student's learning or the achievement of institutional objectives attached to any increase in the amount of space per student or for any other unit that you would mention.

Now, briefly the situation in colleges and universities in the United States can be summed up (and this is based upon the data in the manual and in the norms) in the observation that in the typical institution the classrooms and instructional laboratories are occupied by classes about half the available periods in the week. The average number of periods is about twenty-two. About one-half of the seats in the classroom, student stations is the technical term that we use, are ordinarily occupied when the room is occupied, or again basing it on a forty-four period week, you see that would figure out that about one fourth of the seats are occupied. This is the typical situation. Some institutions demonstrate more intensive use and some less intensive use, but the range beyond that is not nearly as great as you might imagine and there is considerable range below it in terms of effectiveness of utilization.

Or you could put this the other way around. If every seat in every classroom and instructional laboratory were occupied by a student every possible hour of the weekly class schedule, assuming again a forty-four period week,about four times as many students as are at present enrolled could be accommondated in the college and university plants in the United States. The elementary schools are accustomed to that kind of utilization. In fact, in some cities, more than that because they have two students occupying a seat on a double shift basis. The high schools run something like eighty percent seat utilization. In many cities, you can't build a new high school until there is some kind of a utilization approaching that factor. But in a college or university, you can consider yourself better than average if the seats are occupied one fourth of the possible time in a weekly schedule.

Now, it looks easy then to take care of this great increase in enrollment just by filling up the empty seats, by using the classrooms when they are not otherwise occupied. The solution isn't quite that simple. There are institutions in which administrative officers and faculty co-operating together have worked very diligently but I have to say, unsuccessfully, towards such a goal.

Obstacles to Improved Utilization

The top of the percentile scale is far below the hundred percent utilization level. There are numerous and very formidible obstacles in the way of achieving this theoretically perfect utilization of classroom and laboratory space. Some of these obstacles are firmly imbedded in our academic traditions, but probably are not irremovable. Others arise from circumstances completely beyond the control of the academic institution. I think it might be worthwhile here this morning to note some of the circumstances that lead to this wide gap between the present rates of utilization of instructional space and those that might be said to be theoretically possible in the colleges and universities. I intend to devote most of my time this morning discussing some of these obstacles to the theoretically perfect utilization.

Pressures for More Space. The first one, and in my judgment perhaps the most important, is the fact that the pressures on an institution from outside and from within as well, are always in the direction of providing more plant space. The local community, the Chamber of Commerce, the constituency of the institution, -- they always look upon new buildings as the most tangible evidence of growth and prosperity. This is much more important to them than the employment of additional outstanding faculty members. You could hire a Nobel Prize winner on your faculty and not get near the publicity you would if you built a new shop for your maintainance crew in the average community

A college president once said to me, this sort of epitomized it with me, 'Before I took office here,' he said, 'not a single new building had been constructed on this campus for twenty-seven years.' That, to him was just devastating evidence of stagnation and decay until he took over. Of course it's been different since, as you could imagine.

In fact, the president, himself, is probably one of the important factors that lead to pressures for more plant facilities. The president normally takes great pride in the new buildings he has constructed during his term of office. He always uses that pronoun. You walk into almost any presidents office, and this has always been true, this is not just a phenomenon of the recent expansion in enrollment, and within an arm's reach of his desk there is always a portfolio of architect's drawings and plans for the new building.

Somehow the pride the presidents take in the development of their physical plants remind me of old King Nebuchadnezzar, way back in Babylon some twenty-five hundred years ago. If you've read the book of Daniel you have noted probably the words of King Nebuchadnezzar as he walked around his magnificent palace; and the King spake and said, 'Is not this great Babylon which I have built for the royal dwelling place by the might of my power and for the glory of my majesty?' Those of you who know the Bible will recall that shortly after those proud words were uttered the King became insane. He had the humiliating experience of being found out in the pasture field in the morning nibbling grass like an ox and he had quite a time before his sanity returned.

Well, it's not only the president--and I don't mean to poke fun at the presidents particularly--it's not only the president within the institution that generates pressures for those additional plant facilities. Department heads, deans, professors, all bring constant pressure on the administration of an institution to provide more space for their activities. In some fields, the professors and the deans are aided and abbetted by national accreditting associations which also will come to their rescue if the administration of the institution is not coming across with what they would like by way of plant facilities. Each school or college in the university and each department in a college ideally wants a building of its own, preferably with the name of the subject matter field over the portal to proclaim to the world the importance of that particular division of human knowledge. Not uncommonly, the form of appeasement that is necessary to retain at the institution a distinguished dean or professor when he gets an offer from some other institution is the provision of a new plant facility for his beloved speciality. Research programs, especially those sponsored by agencies outside the institution such as the Federal Government and industry, also bring their pressures for additional plant space.

Often the need for a new building is justified by reference to the obsolescence of an old building which is reported to be no longer suitable for occupancy and therefore just must be replaced It usually seems amazingly easy to get an opinion to this effect about an old building from a competent architect or engineer If you've got a building that you want to replace you' have no trouble getting an opinion that it ought to be replaced from very good professional sources, but the demolition of an existing building, however ancient and decrepit it may be, is a rare occasion upon a college or university campus in the United States, even those buildings originally constructed or brought to the campus as temporaries have an amazingly long life as we all know. Now these pressures for the provision of constant additions to the plant facilities andthe corresponding reluctance to abandon or demolish obsolete buildings are a most important reason why utilization of plant space remains relatively low in most American colleges and universities.

Proliferation of Courses. There's a second circumstance that contributes to the low utilization of instructional space. It's the very wide variety of course offerings available in practically every college and university in the country. Under the elective system students at even the undergraduate level may choose their subjects of study from a wide variety of courses. At the graduate level the range of subjects of study is almost infinite. We have made the calculation at New York University, for example, that a student carrying a normal program of thirty-two points or credits a year, devoting full time to his studies, would need more than three hundred years in which to complete all the courses that are available to him at present.

Now this division of subject matter of collegiate education into such a large number of supposedly different course units has both it's advantages and its disadvantages from the point of view of the instructional program itself, and I think faculties need to consider the diffusion into narrow fields of specialization from the point of view of the educational program first, without reference to its effect on use of instructional facilities. But the practice does almost inevitably tend to lower the utilization of instructional space. When students are confronted by such a diversity of course offerings it ordinarily happens that some of the courses attract only a small enrollment. The typical institution will have twenty-five percent or more of its student groups smaller than ten. Such classes usually occupy a room that has from twenty-five to fifty seats and, of course, the utilization is correspondingly small. Furthermore, the division of the instructional program into so many specialized courses results in requirements for certain unique facilities, useful only in a very limited field of study. Thus, rooms are set aside for these specialties and are not available for other subjects, even though the special courses do not utilize the rooms fully.

It seems clear that if the colleges could eliminate a large proportion of the highly specialized courses they now make available, and particularly I think this is true at the undergraduate level, the instructional space could be much more effectively utilized. Some of us think that the instructional program itself might be more effective if such a step were taken.

Type of Instruction. There's a third circumstance that leads to ineffective utilization of instructional space. It arises from the fact that certain kinds of instruction are inherently heavy users of plant facilities. Perhaps the most conspicuous example is laboratory type of instruction, and I will devote my time solely to that type, but there are others. The instruction by the laboratory method seems to require about six times as many square feet of floor area per unit of student credit granted as instruction in the conventional classroom. That is, among the credits required for graduation, a hundred and twenty, usually, those that have been achieved by the laboratory method of instruction have cost the institution about six times as much in terms of provision of floor space as the credits gained under other kinds of instruction. Furthermore, the utilization of laboratory student stations is usually lower than that of the conventional type of classroom, so the provision of plant space for laboratory instruction usually has more than six times the floor area per student credit than is necessary in ordinary classrooms.

The question should frankly be faced as to whether instruction by the laboratory method needs to be as widely provided and even required as it is at present for students who will not become specialists in science. Here, of course, I court a great deal of opposition from the scientists who ride high at the present time, and yet I think we have to raise a question as to whether it is as necessary, as we have thought it was, for everybody to have this sort of educational experience or whether we can provide instruction of equal quality by some method which is less expensive of plant space.

Organization of Educational Experience. A fourth circumstance that contributes to the low utilization of instructional units, in some institutions, is the nature of the packaging of our course units. For example, a course that meets four times weekly, four hours weekly, commonly leaves the room unoccupied for one or two other hours of the week when it might be used, or in another case which I ran into in New Mexico, one of the chemistry departments insisted that the only economical way to run a laboratory in chemistry was to have the students in it for three consecutive hours. Well, you can see that if it were taught in two-hour units, you could get eight hours of use instead of six out of the room.

The difficulty arising from the packaging of courses can, to some extent, be overcome by administrative devices. For example, if the cherished notion is abandoned, the notion that is firmly rooted in our academic tradition, that a class has to meet at the same time on Monday, Wednesday and Friday, if those cherished notions which have no support from research at all could be abandoned, you can schedule three hour classes, four hour classes, two hour classes, anything else and fill up your classrooms much better than most of us do.

Awarding Credits. Another circumstance which does not directly affect utilization rates but which does affect the extent of instructional space needed per student is the traditional notion in America that the extent of the student's academic achievement is measured solely by the length of time he has occupied a seat in a classroom or under some form of instruction in a laboratory. The whole credit system which is our measure of whether or not you have a degree is tied completely to the sitting time of students. He has to sit fairly successfully, of course, and especially during the final examination, but if he has not sat the required number of hours you're probably not going to give him a degree.

Now, let's just frankly ask, is it absolutely necessary that a student sit under a college teacher for fifteen hours a week for thirty-six weeks a year for four years in order to achieve the bachelors degree? Ask the question, why not twelve hours a week, why not ten? What is there sacred about fifteen hours a week? I may say that some institutions violate these standards and have done it for many years. Perhaps we can devise alternative methods of demonstrating academic achievement. For example, carefully administered examinations might reduce materially the extent of the instructional space required to meet the needs of the greatly increased enrollment expected during the next decades. I'm sure we use a great deal of our plant space for nothing more than to bore students by repeating things that they already know. If you, as a teacher, never tried the experiment of giving a pre-test to your class the first day or two, you may be shocked at how much of what you are going to teach them they already know. Of course, the students may not survive the rough experience of having to take an examination the first day in a course but it's rough for the instructor as well, I amy say, and so it hasn't been tried very much. But there is a possibility that we might encourage students, by means of pre-tests and other measures of achievement, not to enroll in courses particularly when they already know the subject matter.

Schedule of Classes. The sixth circumstance that handicaps institutions in their efforts to improve the utilization of space-- this is the one perhaps most familiar to us all--is the well-known tendency of the demands for instruction to peak at certain times of the year, on certain days of the week, and at certain hours of the day. You must provide instructional space for those peak loads. The reason that we have low utilization is not because of the lack of utilization during one period in a week in a certain period of the year, but becausein the rest of the time the class-rooms and seats are not filled.

In many colleges that maintain no summer sessions the use of instructional space is confined to nine months of the academic year, and even in those that do maintain summer sessions the use of instructional space is normally only a fraction of the nine-month year. The tri-mester plan is being tried out in some cases as a means of spreading the instructional program during the entire year. I'm a little worried about all the ballyhoo that has attached to some of the tri-mester plans. I doubt if it's quite the panacea that Time Magazine has suggested, for example, and some other places that aren't too reliable as sources of information about educational matters. But, perhaps it deserves experimentation so that wemay know whether this ia a way in which we ca fill up classrooms twelve months of the year, or eleven months, or eleven and a half or whatever it turns out to be, instead of nine.

During the academic year, forgetting now the summer session fo the moment, the heaviest enrollments are normally in the fall term or semester. The low during the winter or spring terms is nearly always about ten percent less. In fact, we always compute utilization as of the fall term or semester because that represents the peak load. The figures that I have given you on utilization rates are all computed on fall semester returns. There could be, easily, an increase of five or ten percent if in some way we could keep things going the second semester at the same level of enrollment demand as we have at the fall semester.

Within the weekly schedule, Saturday is used to only a limited extent for instructional activities. In some universities the only classes that are on Saturday are those that are maintained for part-time students on an extension basis. Classes on Friday and Monday typically, are less well populated than those during the middle of the week. Tuesday and Thursday tend to be lightly used. You see that just leaves Wednesday as the day when we really use the classrooms. Generally there's no football game on Wednesday and no dance that night so the classrooms get pretty well filled up on Wednesday.

Then you narrow it down to the hours of the day when classrooms are extensively used--nine, ten, eleven o'clock being the favorite hours. The laboratories tend to be used most heavily in the afternoon. There is a sort of "theory" that sutdents can learn in the classroom only in the morning and they can learn in a laboratory only in the afternoon and so that had been used widely in many insititutions as a scheduling policy. In contrast, however, to this usual pattern, some institutions in urban areas that maintain evening classes often find their heaviest use from six to nine P.M. At New York University, that's our peak load and Monday, Tuesday, Wednesday, and Thursday nights from six to nine is the time when we cannot schedule all of our classrooms. Of course, Friday night nobody goes to class and Saturday night. But whatever the pattern of hourly use may be in your local institution, classrooms and laboratories, we feel, must be provided to meet the peak load. If they are not, the enrollment drops off almost inevitable; the service of the institution may be curtailed. Thus, it seems almost inevitable that any institution that really meets the demands of its clientele for service, will find many of its classrooms and laboratories and student stations, unoccupied during many of the theoretically available periods of the instructional day.

Non-Institutional Factors. Now, I want to make this point, that this pattern of hourly, daily, weekly, yearly use of instructional facilities is to a very large extent outside the control of the institutions themselves. It's largely controlled by the willingness or unwillingness of students to enroll in classes at certain hours or on certain days. Students just won't register for classes at unpopular hours in numbers sufficient to warrant the maintenance of a full program of classes. And institution after institution, after trying this business of spreading its program, has discovered, almost without exception, that at these unpopular hours classes are not well attended and frequently have to be cancelled. Professors claim their classes won't be filled with able students if they are scheduled at unpopular hours. There are professors who claim to dislike large classes, who prefer small classes. But there are only a few professors who don't get a much bigger kick out of a well filled classroom than one thatjust has a student here and there. If you schedule a class for four P.M. such a professor will find some good excuse to move it to nine because secretly he doesn't want to face the empty seats that he'll have at that time.

Now, we need to examine these student preferences and find why it is that they prefer certain hours. Many students, for example, take on part-time employment to finance their college education. They must fit their class schedules into the hours of their employment. Employers could do much to remedy this situation by making flexible adjustments in their work schedule for students. I'm tempted to cite the illustration of Willmington College in Ohio, which is in a relatively small town. It had the important problem of finding employment for students. A large concern located a branch of its plant there, partly because the management had a shrewd idea that it might use students as its employees in the plant. Consequently it cooperated with the college to the extent that the student would first fill out his academic shcedule and then the plant would take him on for whatever hours he had available. The plant was running twenty-four hours a day, so they could give them night classes, or night work or evening work or morning work or whenever it best suited the college to schedule classes. Every student first registered in class. If he wanted employment, he then went and got a job in the plant and his hours were so suited. It was interesting to me to discover that this plant was one of the most profitable ones of the whole chain of plants that this manufacturing organization maintained in the United States. Something of a tribute, I felt, maybe to the personnel policy in the plant itself. Ordinarily you don't get that much cooperation from employers. But, if employers are objecting to the payment of taxes for new building or contributions for a new classroom building in your privately controlled college, here is one suggestion that maybe would help them meet the situation.

Students also count on summer employment in large numbers for financing their college education. Ordinarily there's a great glut in the labor market just at the time schools and colleges let out. It might be much better to stagger that entry into part-time, or full-time employment for two or three months so that not everybody comes on the market at the beginning of June. If we could scatter it through the year, students might be helped and the employment market might be helped too.

Parents of students, I think, have a great deal to do with determining the popularity of certain hours of the day, days of the week, and times of the year. Parents like to encourage their children to take part in many activities while they're in college. Reportedly, advice is often given to the youngster going to college to not let his classes interfere with his education. The activities, of course, do tend to limit somewhat the hours when he's going to be free to take on his classes, especially if he's a good football player.

Parents sometimes want their children to be free to come home on weekends. The child is not yet quite emancipated when he graduates from high school and enters college and parents, I think, are not emancipated either and they want to see these children. So they arrange for them not to have any Friday afternoon classes so that they can come home for long week-ends. Many parents want their children with them during the summer because that's vacation time and we'll have one or two more vacations together before the kids get married and then we don't see them any more. As a result, our summer sessions are very largely populated by those who are emancipated from their families. Spinster school teachers, for example, can go to summer session because they don't have the pull of Papa and Mama to get them back home and go up to the lake for the usual vacation.

It's my conviction that the remedy for this very important cause of low utilization of instructional space in colleges and universities, lies largely outside the academic institutions. If citizens and parents do not want to provide additional plant facilities at the present rates of utilization. they will need to revise their attitudes about the times of the day and the week and theyear when their sons and daughters can attend college. Perhaps employers can also be encouraged to adjust hours of employment and I suggest that that is possible.

Some Antidotes

Now, I've not tried to exhaust the list of circumstances that contribute to the low rate of utilization I think it might be useful just very briefly to go ahead and sketch what might be done about it and who might do it. As some of you know.Govenor Rockefeller of New York has appointed a rather high-powered commission to study the problems of higher education in the state of New York. To know what to do about it, the directorof studies for that commission asked me to write him a little memorandum on this problem and what I'm presenting how, is essentially the brief report that I suggested as to what might be done in the interests of improving utilization of space and who might do it and it's organized around the "who's". That is, who is responsible for what.

Administrative Responsibilities. I start with the administration of the institution. The prime responsibility there, it seems to me, is to have statistical studies of space utilization made, frequently, annually, or at least bi-annually, carefully reviewed, analyzed, and used to determine policy. There needs to be on the part of the administration a sincere desire to improve space utilization and a willingness to experiment with and introduce measures that give promise in this direction.

This also implies some familiarity with the research literature on the subject and the suggestions that are made in a great many sources. The proceedings of this conference, I think will be one of those sources when Dr. Jamrich gets them published. The authority over the assignment of classes to rooms and over the assignment of space to any specific use should be completely centralized in the hands of a competent staff member. We have abundant evidence that the policy of decentralizing the assignment of space, of allowing certain units of the institution to claim as their very own certain space without any outside interference results almost inevitably in a lowering of utilization. A centralized administration of all space assignment is essential in the administration.

In the planning of a new building for instructional purposes, careful attention should be given to the existing, the desirable, and the probable future distribution of classes and class meetings according to size. This would warn us at once about taking the present standards of class size. This means, therefore, that classrooms in new construction ought to be on the most flexible possible plan so far as their partitions are concerned. Partitions ought to be soundproof, of course, but non-permanent and easily removable to allow rooms to be made larger or smaller in comparatively small units of space so that they may contribute to better utilization. If you need a room twice as big, it ought to be easily available. If you need a room a third as big, it ought to be easily provided, if it can be done architecturally.

Now, I would also suggest that it ought to be the distinct policy of the institution never to consider any part of the physical plant as belonging to a certain institutional unit, regardless of the manner in which the funds for the building may have been obtained or the specialized nature of the facilities. Instead, all building space in the institution should be considered as available for whatever use is considered most effective in terms of the local institutional program. I may say that we made, somewhat facetiously, a little study when I was in New Mexico of utilization of buildings. We just classified all of the buildings in that state according to their names. We put in one group, those that were named after a field of study, and in the other group, those that were not; those that were named, let's say, after illustrious members of the Board of Trustees or maybe distinguished presidents in the past. Then we compared the utilization of the two groups of buildings. Much greater utilization was apparent in the non-designated buildings than in those that were designated. That is, just by calling a building the English Building or the Chemistry Building or something of that sort, you automatically decreased the usefulness of the building and lowered its utilization.

This leads to another suggestion to the administration. In seeking funds for a new building care should be taken to avoid committments tying the use of the structure to specific and limited function. In case existing committments of this sort are blocking the effective use of some parts of the physical plant, attempts should be made to get a release from the donor. This is true particularly in private institutions, but in some state institutions as well.

The generally cherished idea that the greatness of an institution or the success of its president is measured by the extent of the physical plant or the number of new buildings recently constructed, should be minimized and ultimately abandoned. I don't have any great hopes for this one, but it ought to be considered anyhow.

In small colleges, consideration should be given to the possibility of rendering better service by increasing the enrollment. Studies have uniformly shown that in general, the utilization of building space is considerably higher in larger institutions than in the smaller ones. In many colleges with limited enrollment it would be possible to get more effective utilization of instructional space by increasing the enrollment.

Faculty Responsibilities. There should be a willingness on the part of the faculty to experiment with new techniques of instruction that may require less building space than traditional methods. Also, faculty members should be willing to accept assignments to teach classes at the hours best suited to the full utilization of available facilities. You may have to use some incentives to get that. Perhaps, faculty members should be paid a ten percent bonus for teaching a four o'clock class in the afternoon if that's the only way you can get them to do it. just as we pay people bonuses for night work or holiday work or other times when it's inconvenient for them to work. And we would hope that faculty members could reduce to the minimum their insistence on specialized, permanently installed equipment for the teaching of their classes so that institutional authorities may have maximum flexibility in the assignment to rooms.

Here I have to pause and say that these suggestions may result in a definite conflict with another very important factor in higher education At present we have a scarcity of well qualified personnel for teaching positions. Institutions may have difficulty in persuading faculty members to co operate in efforts to improve space utilization. To put it another way. the university or college that can offer the most lavish space provisions, other things being equal, will probably be able to attract the most capable teaching staff. So, you'll have a conflict of interests here that is going to be very difficult to resolve.

Student Responsibilities. I think there is some responsibility for students in this area. There ought to be a willingness on the part of students to attend classes at hours and days that will fit into the efficient schedule of room utilization. I'm inclined to think that before many years this may have to be a condition of admission. I would much more favor that as a condition of admission than I would a regular system of selection on the basis of college entrance board tests or something of that sort. and I suspect this will become the favorite method of admission just as at present it's much easier for a student to get in if he will come in the summer in many universities than if wants to wait until the fall to start his education career.

Now. here again, let me pause and note that in the competition among institutions for the ablest students, the college or university that can offer concessions about class schedules to suit the students conveneience at some loss of effective utilization of space will be at a distinct advantage. I don't need to point out the football recruiting situation which will inevitably mean that there will be certain concessions about the class schedule to students of that kind of ability.

Community Responsibilities. I've suggested also that ther is a responsibility on the part of thepeople in the community who are going to employ students for part time work. They ought to b willing within reasonable limits to adjust work schedules so that the student may take his classes when the institution finds it most convenient to offer them and do his work at the other hours.

I think the parents of the students have a greater responsibility here. In simple terms, it's just that they might consider that the primary business of their sons and daughters in college is to complete their academic program successfully and that they might forego some of the pleasures of having the grown-up children still with them for the family activities at the times when it suits the family, rather than when it suits the university

The last group that I want to mention includes those who provide funds for new buildings. I think there should be incumbent upon all of the agencies that provide funds for buildings, whether public funds from the legislatures or private organizations, that requests for capital outlay to extend the plant space available to the institution's program should be scrutinized most carefully so that the proposed outlay may be fully justified in terms of its effect on space utilization. I think most of you are probably familiar with the way a college or university gets its capital outlay money from a legislature. It's generally not by the process of an objective view of the situation. The amount and the kind of the space in dollars of appropriation are determined usually by other processes than those which we would recognize as based upon careful study and research.

Now, let me hasten to add that there is no simple formula by which this determination can be made. Competent professional judgment is required of those who would justify a request for building funds.

The second suggestion I would make for those who provide the funds is that specifications should be avoided that would seem to commit any building to specific purposes during its lifetime. My memory goes back a long way to the time Floyd Reeves and I were at the University of Kentucky doing some institutional research. One of the very difficult problems that the president discussed with us was what to do with a building that had been designated by the legislature as the physics and engineering building. Those departments weren't very compatable at that time, and they had drawn a line right down the middle of the building, even down the entering stairway. That was a very distinct line and could not be violated. It got to the point where one of those departments needed more space and was demanding, most uncerimoniously, it seemed, some of the space that was on the other side of that sacred median line. The other department said, 'Well, this is against the law. The legislature said this is aphysics and engineering building and that meant fifty-fifty and you can't divide it that way.' And it took a little doing by Reeves, to work out a system by which the space was used most effectively. Now, this, I think is an argument that ought not prevail at all. The legislature may justify a building because the chemistry department is crowded or because the English department needs more space, but to tie that into an appropriation act and say 'This is the chemistry building' may be doing something that should not be done. In the case of some of the publicly controlled institutions that have received gifts or appropriations with this kind of a string attached to them I think that a state survey is justified to discover what the strings really are, what the legislature did say. If it's found that there are such designations that interfere with the most effective use of the building, I think it would be a good idea for the legislature to pass a resolution rescinding them. and saying that from now on, these buildings are subject to allocation and use by the institutions themselves. I think such a step might also be taken with respect to some of the endowed institutions that have also received funds for specific purposes because they were raised from the donors for particular purposes or maybe a gift from a foundation to supply funds. My suggestion is that in a case of that kind the gift should always be accepted with a time limit on it, not for the entire life of the building but perhaps the next ten years would be enough to commit a facility to a specific purpose.

Conclusion

In conclusion, let me simply point out that regardless of the great efforts that can be made, and I'm convinced will be made for improvement in the utilization of instructional space, colleges and universities in the United States will still be faced with the almost overwhelming need for additional plant facilities during the next two decades. Improvement in the utilization of space will, it seems to me, be able to meet only a fraction of theneed.

THE USE AND PLANNING OF INSTRUCTIONAL FACILITIES IN SMALL COLLEGES

John X. Jamrich

Introduction

The concern of colleges and universities regarding physical plant has gone well beyond the mere question of a sufficient amount of instructional facilities. The imminent increase in college enrollments has also focused attention on the total teaching-learning process. Thus, the result is not only a concern for the amount of instructional space but, perhaps even more important, the adequacy and appropriateness of that space to the curriculum and instructional procedures which may find their place in institutions of higher learning. Certainly, the basic question is whether or not these instructional developments are educationally sound and effective. But once shown to be effective, the focus then shifts to the nature of the instructional facilities which will be needed for this type of instructional process.

These and related problems of instructional facilities have been a continuing concern of the Educational Facilities Laboratories, Incorporated,which has supported and published several studies relating to the above problems. This is a summary of a study conducted by the Center for the Study of Higher Education at Michigan State University and supported by the Educational Facilities Laboratories, Incorporated.

The Study

The purpose of this study was to focus attention on the utilization of instructional facilities and the process of planning for additional facilities in colleges enrolling 3000 or fewer students. The colleges included in this study were located in the area encomposed by the North Central Association of Colleges and Secondary Schools. The study had the endorsement of that Association. The total group of colleges having enrollments less than 3000 was sampled to provide representation by size, location, type of control, and financial strength.

As the study proceeded, it became increasingly evident that one of themajor characteristics of so call "planning" was the lack of a systematic approach to the various problems that have to be faced. Although the past two decades have seen a definite increase in the number of self-studies conducted by the colleges, the fact remains that, for a variety of reasons, many of these studies were conducted in abstract isolation from the total college or there was a lack of recognition of the relationship of these studies to the assessment of need for additional instructional facilities. In general, it must be concluded that the majority of colleges must be characterized as not presenting a systematically developed and evolved plan for future development either in the realm of facilities or many other aspects of the institution.

The importance of systematic study and planning must be underscored on educational grounds even though the dollar-values may, perhaps, be more easily discernible. The degree to which a given college can continue to provide relevent and significant experiences, at a quality level, will certainly depend upon its ability to create an instructional program in response to the demands of its clientele. This in turn, will depend upon the appropriateness of the instructional facilities for the kind of program which is envisioned at each institution. The systematic approach to planning, then, assures a continued dynamic quality to the curriculum and the physical facilities in which the program is housed.

Elements of the Study

The Campus Plan. A majority of the colleges reporting in this study indicated that they had a campus plan, though the character of these plans varied widely.

On the basis of the data and observation of this study, it must be concluded that the majority of colleges have developed their campus plan with generally little resort to a definite planning process. This is attested to frequently by the apparently "accidental" location of campus buildings in relation to each other and to the very inflexible interior design of instructional rooms.

Increasing concern for the integral relationships between the instructional program and the facilities is being reflected in campus plans which are evolving in a number of institutions. In most institutions which have been in existence for decades, it would be difficult, if not entirely impossible to recreate the entire campus arrangement in accordance with some principles of facilities interrelationships. The most vivid demonstration of these evolving plans finds its expression in those situations where a college, after thorough study, decides that its present facilities and location are or will shortly become inadequate for the level of enrollments and the type of instruction which it intends to provide.

One such opportunity presented itself to Calvin College in Grand Rapids, Michigan. We shall hear more of this new campus development at our evening session. Their plan incorporates some of the general aspects of a plan shown in Figure I.

The Buildings. The assessment of the adequacy of present facilities is the first step in providing information as to the extent of future needs. These judgments of adequacy must be made in terms of (1) the structural characteristic of the space and (2) the appropriateness and adequacy of the facilities for the type of instruction contemplated now or for the future. On the basis of the facts gathered for this study, it must be concluded that about one-fourth and in some cases one-third of the present facilities would be judged inadequate for one or both of these reasons:

The data of this study also indicate that the number of classrooms per building has been decreasing during the past 30 years, while the size of classrooms has been increasing, indicating, probably, that the need for the larger classroom is a definite part of the future facilities picture.

Almost 50 per cent of the square footage used for instruction is housed in buildings built prior to 1920. This means a total of about 2.5 million square feet. At an average cost of $25 per square foot, this would imply a capital outlay of 62 million dollars if all of this space were to be replaced in the

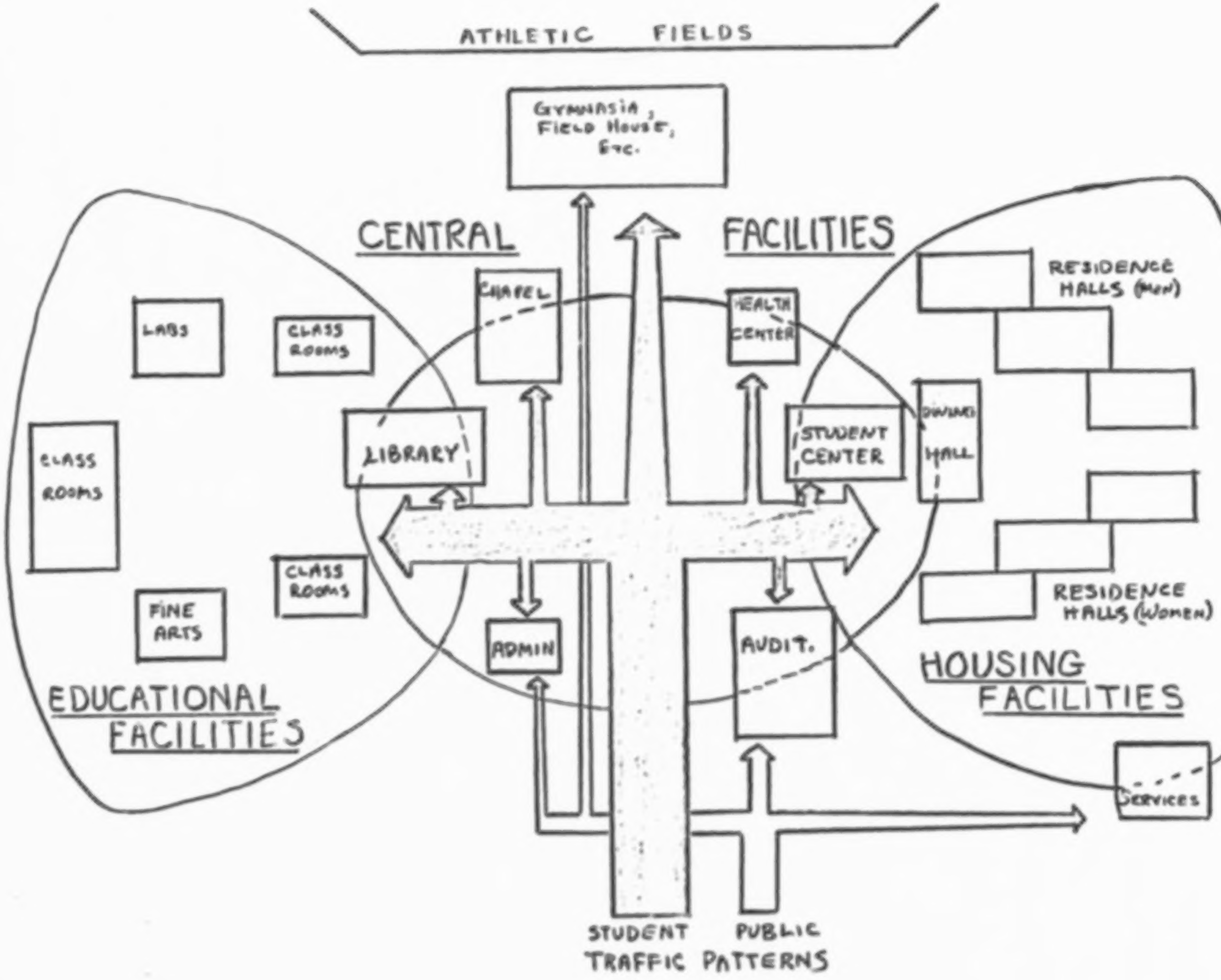
ATHLETIC FIELDS
GYMNASIA, FIELD HOUSE, ETC.
CENTRAL FACILITIES
CHAPEL
HEALTH CENTER
LIBRARY
STUDENT CENTER
ADMIN
AUDIT.
DINING HALL
RESIDENCE HALLS (MEN)
RESIDENCE HALLS (WOMEN)
HOUSING FACILITIES
SERVICES
LABS
CLASS ROOMS
CLASS ROOMS
CLASS ROOMS
FINE ARTS
EDUCATIONAL FACILITIES
STUDENT
PUBLIC
TRAFFIC PATTERNS

Figure 1. Suggested Arrangement of Buildings on a Campus

near future, and over 30 million if only one-half of it were beyond reasonable refurbishing.

For these colleges as a group, the cost of such replacement of the inadequate facilities will more than offset the savings which can be made through a higher level of space utilization. *The important point is that an increased level of utilization must be attained, but this alone will not solve the problem of facilities needs for our colleges*.

Enrollment Plans. About three-fourths of the colleges indicated that they have set an upper limit to future enrollments. The larger colleges in the study generally have not established such limits. In general, the extent of enrollment increases implied by the set limits would result in an average doubling of enrollments during the next two decades in the colleges of this study.

Extent of Instructional Facilities. The colleges reporting data on the extent of present instructional facilities enrolled about 42,000 students. The colleges reported about 1.2 million square feet of assignable classroom and laboratory space now in use. This is an average of about 30 square fee per student enrolled. This would average out at about 40-50 square feet of gross square footage per student in instructional facilities.

In the colleges which reported, there was an enrollment increase of almost 40,000 students during the past 19 years. During this period, the colleges constructed more than 860,000 square feet of assignable space in classrooms and laboratories.

or an average of 21 square feet for each additional student. Assuming that assignable space for instruction might be constructed, in the future, at the same ratio per student as in the past, this would mean that at an average cost of $25 per square foot, these colleges would have to plan on about $525 per student for assignable space for instruction. This would be considerably higher if there were to be more than average provision of laboratory space in a given college.

The Utilization of Instructional Facilities. The second important factor in determining facilities needs is the present level of utilization. The analysis of data on the utilization of instructional facilities in the small college indicates that, on the average, the utilization of classrooms and student stations is such that a considerably larger number of students could be accommodated in the present facilities if these levels were increased.

On the average, general classrooms in these colleges are used about 17 times per week, which represents about a 40 per cent possible utilization in terms of a 44-hour week. Instructional laboratories are used, on an average, about 10 times per week, which represents a 24 per cent level of utilization on the basis of 44-hour week. It should be pointed out that there were wide variations in utilization levels of classrooms and laboratories. Twenty per cent of the colleges used their classrooms more than 20 times per week; twenty per cent of the colleges used them less than 15 times per week.

One of the primary factors which contributes to these generally low levels of utilization is the fact that class schedules continue to reflect the rather traditional practices of unevenness by days of the week and hours of the day. The data on the utilization of student stations also indicate generally low average use.

For the colleges in this study, an improved level of classroom utilization, with careful attention to the instructional program and adequacy of the facilities, could result in the accommodation of 50 to 100 per cent more students without new construction. For these colleges this could be a saving of 12 to 17 million dollars in capital outlay.

Improving Space Use. The emphasis must be placed on the fact that increased use of instructional facilities is not an end in itself, but should reflect careful considerations of the instructional program in relation to such increased use. Several factors would be noted as important in the attempt to improve utilization:

1. Class schedules must make more even use of the entire 8-hour day and the 5-day week.
2. The units of curriculum need to be studied to see possible modifications and their effect on utilization.
3. The weekly schedule may have to be lengthened, as well as the length of the day.
4. Clearly, additional students can be accommodated by means of a lengthened school year.
5. Exploration of the trational question of student station occupancy for each credit rendered in a course.
6. Exploration of the question of the need to provide such extensive laboratory space and equipment for the non-science major as is provided for the majors.

7. The planning of new facilities with considerably more flexibility for use than some of the traditional construction.
8. Careful attention to the size and shape of each room.

Planned Construction. The 62 colleges reporting on the item of planned construction indicated existing plans for capital outlay totaling over 95 million dollars for instructional or related facilities. At the present rate of facility per student, this would mean additional facilities for about 37,000 students in these colleges. The planned construction will consist of about 800 classrooms and 700 laboratories. (Table 111)

In these colleges, there were 33 in which no planned expansion of library facilities is planned. Forty-five plan on either new facilities or an addition to present ones.

Faculty. To keep pace with the rising enrollments, these colleges have increased their instructional staffs. These increases, however, have not been at the same rate as the increases in student enrollments. During the years preceding 1955, the average student-faculty ratio in these colleges remained fairly constant. It showed an increase between 1955 and 1959, reflecting, perhaps, the general trends to provide instruction through larger classes in some of the institutions. (Table 105)

The use of large classes, however, is not general among the reporting colleges. In the colleges enrolling less than 700 students, over 30 per cent of the classes enrolled less than ten students, and only 8 per cent enrolled more than 40. (Table 106)

The average salary of faculty members in these colleges has also been increasing during the past 20 years. It has moved

Table I

Planned Construction of New Instructional Facilities Reported by Colleges in This Study

Size of Enrollment	No. of Colleges Reporting	Total Anticipated Capital Outlay	No. of New Bldg.	No. of Add. Renov	No of Add. Classrooms	No of Add. Labor	No of New Stu. Prov. for @ 25 Stu per Rm	Aver Amt per College
1500-3000	13	$34,418,730	24	8	261	296	13.925	$2 647 594
1000-1499	13	25,615,000	25	8	100	128	5.700	1.970.384
800-999	10	12.478.000	17	5	130	103	3 325	1.247.800
400-799	16	14,855,000	27	9	223	127	8,750	928,437
Less than 400	10	8,379,400	10	5	76	43	3,025	837 940
TOTAL	62	95,746,130	103	35	792	697	37 225	1.544.292

Note 1 Number of Students Enrolled, 1959=56,000

Note 2 The average of 25 students per room is based on the analysis of use and extent of space in 65 small colleges

Table II

Average Number of Students Enrolled per Full Time Faculty Member in the Colleges Participating in This Study, 1940-59.

Size of Inst. Enrollment	1940-41	1950-51	1955-56	1959-60
Over 1500	15.9	16.3	17.4	17.6
1000-1499	14.3	14.2	14.2	15.6
700-999	12.3	14.2	12.8	15.2
400-699	14.3	13.3	12.9	14.9
Less than 400	11.3	10.3	11.5	12.1
TOTAL	14.3	14.5	14.6	16.0

Table III

Distribution of Class Size in the Colleges Participating in the Study, 1959-60.

Percent of Classes

Size of Inst. Enrollment	Less than 10	10-19	20-29	30-39	More tha 39
Over 1500	17.9	24.6	27.7	16.6	13.3
1000-1499	16.0	27.2	27.9	15.9	13.0
700-999	20.5	29.7	23.7	13.5	9.7
400-699	30.5	30.0	17.9	13.0	8.5
Less than 400	35.3	28.1	17.6	11.6	7.3
TOTAL	20.8	27.2	25.4	15.1	11.5

from an average of about $2300 in 1940 to over $5000 in 1959. There are definite difference in the averages found in the colleges enrolling less than 400 and those enrolling more than 1500. (Table IV)

The response to the question of average salaries to be paid during the next ten or fifteen years indicates that by 1975 these colleges see an average salary of about 9-10 thousand dollars, a figure well below what has been presented in other studies.

The Curriculum. A fairly large percentage of the responding colleges indicated that a curriculum study was under way. These studies varied from very intensive and extensive to some rather minor considerations of course and departmental revisions.

The very small colleges in this group list an average of 1.98 semester hours of different courses per student enrolled, while the larger ones in the group average less than one semester hour per student.

In the very small colleges, the average number of majors per 100 students enrolled is over 4, while in the larger colleges it is just slightly over 1.

Finances In general, the colleges in this group derived about 40 per cent of their income from student tuition. The very serious problem here, however, is the fact that in many of the very small colleges of the group, the average amount derived from student tuition is about $400, while in the larger private ones it is about $650

TRENDS IN AVERAGE FACULTY SALARIES PAID IN THE COLLEGES PARTICIPATING IN THIS STUDY, 1940-59, WITH ANTICIPATED AVERAGES TO 1975

Size of Inst. Enroll.	1940-41	1950-51	% Incr. Over 1940	1955-56	% Incr. Over 1950	1959-60	% Incr. Over 1955
Over 1500	$2383	$3933	65	$5071	29	$6301	24
1000-1499	2565	3910	52	4956	27	6590	32
700-999	1993	3350	68	4424	32	5811	31
400-699	2266	3261	44	4088	25	5438	33
Less than 400	1915	3221	68	4158	29	5002	20

	1965-66	1970-71	% Incr. Over 1959	1975-76	% Incr. Over 1959
Over 1500	$7467	$9500	51	$10,000	59
1000-1499	7500	8325	26	9,188	39
700-999	6960	8200	41	8,992	55
400-699	6289	7222	33	8,175	50
Less than 400	6760	7218	44	7,500	50

Factors to Study In Planning

As has been indicated the problem of assessing and providing for physical facilities needs as well as other institutional problems, has frequently been approached in a fairly informal and unsystematic manner. There is very wide variation in the extent to which faculty participate in the initial planning and study. Furthermore, there is wide variation in the scope of studies which the colleges undertake in their attempt to assess their individual problems.

More often than not, the president and board of trustees have proceeded well down the road of decision before the faculty is aware of what has happened. It was found that the faculty do participate rather directly in the deliberations of the specific characteristics of a particular building which has been decided upon by the president and the board.

More often that not, the decisions regarding the needs for facilities have been based mainly on some *projections of enrollments* for the college without full study of the nature of these enrollments, the implications for the curriculum and for instruction, and the resultant staff needs. These in turn effect the financial base from which a college can move toward providing new buildings.

When the planning of colleges is viewed in the perspective and setting of this tudy, it becomes clear that there are several factors which are inseparably intertwined and which must be studied thoroughly in the process of establishing facilities needs in a college.

1. Enrollment:

   a. What have been trends in institutional retention rates?

   b. Where have the students come from?

   c. Are there new areas of service which can be developed for additional students?

   d. What has been the academic potential of the students?

   e. What have been themost frequent areas of study of past students?

   f. How will future enrollment of this institution reflect the state and national trend expected?

   g. What would be a realistic level of enrollment to expect during the next two decades?

   h. Given these levels and improved retention rates, what can be the expected enrollments in the several classes of the colleges?

2. Faculty:

   a. What is the level of preparation of the present staff?

   b. Should this be improved?

   c. If so, where will the source of such improved staff be?

   d. How many new staff will be needed in the specific areas of study to provide for retirement alone?

   e. How many will be needed to provide for the increased enrollments assuming no change in the present program and instruction program?

   f. How many will be needed if certain changes are effected in the curriculum and instruction after careful study of these?

   g. How has the current salary schedule provided for competition for the types of faculty needed?

h. What will the level of salaries have to be during the next 20 years to provide for retention and attraction of competent staff?

3. Curriculum and Instructional Program

a. What are the purposes and objectives of the college and how are they translated into operational terms in the classroom and the campus as a whole?

b. How appropriate is the curriculum for present and future social, technical, and cultural demands?

c. What is the scope of the present curriculum in terms of the number of courses, the number of majors, and the number of different programs offered?

d. What are the present practices in class size?

e. What are the present practices in faculty teaching load and other responsibilities?

f. How adequate are the supplementary learning facilities such as the library?

g. What is the extent of small classes being taught, classes enrollment less than five and less than ten students?

h. How extensively are large classes utilized in the instructional program of thecollege?

4. Finances:

a. What is thelevel of the total income of the institution and what proportions of it are derived from specific sources such as student fees, endowment, gifts, church or other appropriations? Are these proportions in line with those in comparable institutions, and, even though the proportions may be high enough, are the actual amounts available sufficient to provide operating capital for the important phrases of instruction and other elements of the college?

b. What is the economic level of the student clientele?

c. If it is a church college, what is the economic potential of the church constituency?

d. Has the alumni group been brought to a satisfactory level of contribution?

e. If the institution serves a metropolitan area, has this provided enough in terms of contributions and students?

f. What will be the level of total expenditure in the future to provide for the program and faculty envisioned?

5. Instructional Space:

a. How adequate ispresent instructional space?

b. How adequate is present faculty office space. if the individual faculty is to play an increasing role in leading the student toward individual study?

c. What is the present level of utilization of general classroom and laboratory space?

d. How many additional students could be accommodated if the adequate space were used at some higher level?

e. What are the factors which inhibit the better use of space on this campus?

f. If new space is needed, what should be its extent and specific character to provide for the type of instructional program which the college plans to offer?

g. How will new facilities be financed?

The implementation of studies designed to provide institutional answers to the preceding questions is vital to an adequate assessment of need for new facilities and programs for the college. The most effective vehicle for planning and carrying out such studies and then coordinating and relating the results toward a unified plan is to be found in a Faculty-Administration-Board of Trustees Committee. It is clear that this single committee would not take on the responsibility of planning and actually carrying on all of the studies, but such a group is essential to provide the necessary leadership and coordination to make for success of the procedure.

Conclusions

The data of this study, accumulated by means of questionnaires mailed to a representative sample of colleges enrolling less than 3000 students, and by means of personal visitations to a number of the college campuses, focus upon the importance that attaches to careful and systematic planning by individual colleges in determining and providing for program and facilities needs. The small colleges will continue to render a significant service in higher education, and will, therefore, be called upon to plan for the level of service which they intend to provide. The provision for this level of service cannot be developed haphazardly and without thorough analysis of all factors relevent to each college.

The thoroughness and scope of the planning necessarily places certain demands on the small college which in the case of the large universities has generally been met by the establishment of specific administrative offices responsible for study and analysis of problems relative to policy matters. Typically, the small college finds itself in a position of not being able to provide such an office. For one thing, the expense involved, in proportion to the overall institutional operation may appear excessive.

Hence, the typical small college will have to depend upon some other approach for providing a systematic plan for its future. The most effective procedure appearing on the present scene is the one suggested in this study and employed by an increasing number of colleges. It involves the full participation of faculty, administration, and the board of trustees in the development of institutional plans. It involves outside consultants, but not to the extent that the college turns over the entire matter of study recommendation to an outside organization and receives from it a detailed and specific set of blueprints for the future of the college. The failure to involve the total faculty from the very beginning in the development of plans and indentification of needs too often results in a plan that certainly may be consistent within itself and perhaps even appropriate to the college, but it has less chance to reflect the unique traditions and aspirations of each college.

The present study has brought together information and normative data which should prove highly useful to individual institutions as they plan for the future. It should certainly prove useful to the educational and architectural consultants who have continuing need for such normative data.

Perhaps the most forceful recommendation that can be made as part of this study relates to the manner in which the colleges, large and small, which have not developed a total institutional plan can be assisted in the effort. There appears to be a need for the identification and establishment of regional resource and reference centers to which all colleges could look for competent and experienced assistant in the development of total institutional study plans as well as professional assistance in carrying these plans out. In order to assure that such personnel are clearly competent in the total educational operation of colleges, it would seem most feasible that such centers be given identity in universities regionally throughout the country.

The second recommendation relates somewhat to the first, but from a different point of emphasis. As the colleges study themselves and plan, it is evident that the one thing which emerges is the concern for the relative significance and interrelationship of one factor of the college picture to another. For example, if the faculty attempt experimentation with different class sizes and at the same time make certain modification in the number of hours taught and major areas of study offered, what implications does this have for faculty and student load and for the salary levels of faculty members? What can the college expect of total enrollment increases and in certain subject areas? How does the level of possible space utilization relate to scope of course offerings and class size?

There is need, then for systematic research into the total programming of the managerial aspects of the college. Is it possible, for example, to construct an abstract mathematical model of a complete college which then can be utilized to yield useful information to our colleges and universities in the transitional stage from one enrollment level to another and from one type of instructional procedure to another? Research into this phase of the college problem would perhaps, yield results useful to them in theirplans for additional physical facilities as well as other aspects of their programs.

There is one additional area in which considerably more research is needed. Typically, the assessment of the adequacy of facilities has been based on brick, motar, and structural characteristics. There is a need to bring together research on the adequacy of instructional facilities and environment in terms of their relationship to effectiveness of instruction. That is, what differences in the quality of learning can be observed under different conditions of physical plant environment?

PRESENT AND FUTURE FACILITIES NEEDS:
THE NATIONAL PICTURE

John B. Rork

I am pleased to have this opportunity to appear on the program of this conference and to assist in the important work of looking into the need of the nation's colleges and universities for increased physical facilities.

While students enjoy their summer vacation this year, college officials will be grappling with one of the most vital assignments in the history of education. Their problem is how to provide enough new classrooms, laboratories, dormitories, and teachers to take care of the student boom.

The Need

The number of young men and women seeking a college education has soared from 2,116,000 in 1951 to about three and a half million in 1959. The U.S. Office of Education estimates that by 1970 the number will increase by about two and one-half million.

Since many colleges and universities are already pinched for space, educators are wondering how they will teach and house the new arrivals. Although I will stress the vital necessity for physical plant expansion, one must keep in mind that this problem is only a part of higher education needs.

U. S. Commissioner of Education, Lawrence G. Derthick stated before the Subcommittee on Education, United States Senate that "It is perfectly obvious that if our colleges and universities spend too little on physical plant, the quality of research and teaching will suffer; if they spend too much on bricks and mortar, irreparable damage may be done to faculty and student morale, with a consequent detrimental effect on the total educational process. The major components of need among our colleges and universities stand or fall with one another; it would be a serious error to stress one at the expense of the other."

It is my belief that large numbers of students may not be able to enroll in the college of their first choice, or possibly second, third, or even fourth choice. If students are forced to submit innumerable applications to find acceptance in a college, perhaps in one not high on their list of preferences, large numbers may become discouraged and turn from their goal of pursuing higher education.

One thing is certain. Crowded classrooms are going to require that students study harder than ever before because more and more institutions will start flunking out poor students at the end of their freshman year rather than giving them a second chance. Failures will find it extremely difficult to enroll in another school.

To me, one of the most disturbing factors in the over-all picture is my fear that even though accommodated in a college, the student may find that the quality of education offered may be poor due to inadequate staffing and that the well-being of the students may suffer due to inadequate or dilapidated classrooms, laboratories and housing facilities.

In my remarks about planning for campus facilities to meet urgent future needs, I am going to concentrate mostly on three types: (1) for instruction, (2) for research and (3) for general service facilities. I believe that these are the areas of greatest concern. Other types, those for auxiliary enterprises dormitories, apartments for married students and for faculty, and student centers are self liquidating, or to a large degree can readily be so. If a new dormitory is really needed, there is no shortage of investment capital to bring it about although the current rate of interest may present a problem. If there is no student center or if there is an inadequate one, the student body will vote with a "whoop and a holler" to assess itself and many succeeding generations of student bodies to provide one which will have a shade more chrome than the one that Jones University built last year. "What Lola wants, Lola gets."

The serious business of the college or university is instruction and research. Also, classrooms and laboratories must be backed up by such general facilities as heating plants, auditoriums, shops, and administrative offices. If you plan intelligently for the facilities for these central functions and obtain the financial resources to bring those plans to reality, you will not need to worry too much about money for the self-supporting units.

In general reference such instructional and general facilities and much of the teaching-laboratory category are lacking in popular appeal in a campaign for capital funds. Construction funds for shortages in those areas are not readily obtainable. Classroom buildings and offices for instructors are not very dramatic. Fortunately, there are some instructional categories, however, which elicit enthusiatic endorsement. For example, teaching hospitals have a double-barreled appeal: preparing competent medical and nursing people for tomorrow's patients while alleviating the misery of today's sick.

Undoubtedly, much of what I have suggested is not news to you. It is possible, however, that if I can give you an ove all view of the national picture of physical facilities to be urgently needed in the very near future, you may see the problems of individual institutions in a new perspective.

The Office of Education has devoted considerable time a energy to the study of higher education physical facilities needs, and it will be from the findings of these studies that I shall draw the data and materials to be used in estimating current needs and projecting future requirements. Much of the material that I will present will paraphrase testimony given b Secretary Flemming and Commissioner Derthick before Senate and House Subcommittees on Education in June of this year.

Without taxing your patience with too many statistics, let me take a short-cut or two and arrive at one of several creditable enrollment projections for 1970 and its implication for physical facilities. According to this projection, by 197 instructional facilities will be needed for 6,006,000 students part-time and full-time. By subtracting from that figure the rollment for 1959-60, 3,402,297, the difference is roughly the number of additional students for whom classroom space and laboratory facilities and library books and heating plant capacity, should be in someone's current planning assignment. As the fall of 1959, the number of additional students was 2,603,703, representing a prospective increase of 77 percent in eleven years, 7 percent a year if it were to be evenly distributed. However, this increase will not be evenly distributed throughout the eleven-year period. The profile will follow the birth-rate bulge of the post-war 'forties and should reach a peak acceleration about 1965 or 1966. Such rough projections, of course, tend to be over-simplified. Actually, we are taking aim at a moving target as if from the deck of a pitching cruiser.

The other evening, I watched a T.V. program in which a scientist sketched the problems involved in aiming a space vehicle from the earth moving in one orbit at one rate of speed, directed to the moon moving in another orbit at another rate of speed. Some such scientific concept as that is needed to accurately forecast our future facilities needs. Even if we make accurate projections as to numbers, who will hazard a forecast as to what subjects and in what intellectual skills they will need to become proficient? Not only will there be more college-age students in the population in the years immediately ahead, but the very proportion of our young people of college-age who apply for college entrance is accelerating. Moreover, these young people are staying in college longer in order to earn more advanced degrees. How much will these factors accelerate the 1967 enrollment? The 1968 enrollment? and on into the future? Efforts on the part of private and governmental agencies to make college attendance possible for those who are qualified but need financial help is increasing greatly, as well as the volume of money at their disposal. The National Defense Education Act is a case in point.

As a "minus" factor in the formula for projecting additional facilities needed, there was in 1959, (and perhaps always will be) a variable amount of slack in the form of currently unused capacity. It would be a complex calculation to arrive at a figure which would represent a practicable saturation under conditions of extreme pressure. An unavoidable amount of unused capacity occurs by reason of attrition during the academic year. Other student spaces are not generally usable when they occur in specialized or professional schools. Likewise, unused instructional capacity which is not accompanied by a normal proportion of available residential space is usually of little practical use. One survey indicated a 14 percent latitude or overage in instructional facilities. That figure is surely subject to interpretation. Capacity in terms of the number of student stations and their judicious use by effective scheduling, is a considerable variable. Space utilization studies have yielded some surprising results in unused capacity for instructional purposes. Some of our academic people are inclined to be poor stewards of space and time but may find the issue forced upon them by the acute pressures of student needs. A forty-four hour week for classroom use does not need to mean a forty-four hour work week for instructors, but it might be one way to avoid raising funds for a new building at any given juncture. Better "tailoring" of classrooms to class size can be done if rooms are scheduled after registration.

As you know, some institutions are experimenting with accelerated programs. trimester plans, eliminating low-enrollment courses. and other expedients to try to get more instructional hours out of their existing facilities. Some are finding that to make a new top floor out of an attic results in additional assignable square footage at a fraction of the cost of the same space in the form of a new structure. Finishing a basement area, providing or rearranging partitions and enclosing areaways are other possibilities for "make-do" measures.

"Plus" factors in the formula for projecting future requirements in instructional facilities are required to cover the ravages of time and the annual toll of obsolescence. On your own campus, it occurs so gradually that you can shut your eyes to it and pretend it isn't there. Fifty years is a fair average for the life span of an instructional building before you begin to make apologetic noises when a new instructor is assigned to it. (The 50-year average will hold only if you are free of an over-supply of "temporary" war surplus structures.) For purposes of statistical computation and projection. this 50-year span can be converted into a two percent per annum factor as applied to the students for whom replacement facilities should be provided each year even if enrollments remain constant. In other words, two percent of the number of student stations in your instructional facilities should be added to your construction planning just to stand still in facilities

Facilities to Meet Expanded Enrollment

Having stated some of the qualifying factors which affect projections of facilities planning for the future. I would now like to share with you some of the specifics of our Office of Education deliberations on this problem.

A projection of enrollment increases, to be realistic, should show the anticipated full-time and part-time enrollments. From comprehensive Office of Education enrollment reports and from a study made by the Bureau of the Census in 1958, it has been ascertained that approximately 75 percent of the total enrollment in higher education is composed of full-time students. Assuming that this percentage remains constant to 1970 and that total enrollments will increase to 6,006,000 students, full-time enrollments will increase from 2,551,723 in 1959 to 4,504,500 in 1970, an increase of 1,952,777.

The increase in part-time students by 1970 on this basis is estimated at 609,750. Because part-time students usually attend school at times other than peak periods for full-time students, increases in part-time enrollments will not pose as serious a problem as full-time enrollments at most institutions. In institutions situated in urban centers, however, large increases in part-time enrollments will require sizable plant increases.

In attempting to assess the cost of facilities needed to accomodate these additional numbers, full-time students only have been considered. This number has been further reduced by 200,000 full-time students (from 1,952,777 to 1,752,777) to provide for more efficient utilization of existing instructional facilities, including those spaces which are presently not being used. This reduction is considered reasonable based upon unoccupied space data presented in the College and University Facilities Survey, Part 2, of the Office of Education.

On the basis of careful analysis of current practice, another step was to ascertain the average number of square feet of space for instructional and related purposes that would be required to provide for each additional full-time student. Although construction costs had increased 43 percent during the past 10 years, the average 1959 construction cost per square foot for educational plant expansion was established from survey data submitted to the Office of Education by colleges and universities and used to achieve a dollar estimate of total cost.

By multiplying the space required by numbers of students and by cost per square foot, we determined that the total cost of instructional and related facilities needed to accommodate enrollment increases between now and 1970 would be $8,413,329,000.

The need to accommodate increasing numbers of students accounts for only a part of the upsurge in physical facilities requirements. Increasing relative emphasis upon graduate and professional education must also be taken into account.

Graduate and professional school facilities- expensive by definition--must be provided in great quantity if we are to prepare highly trained individuals for the needs of the future. Although facilities for this purpose accommodate only a relatively small fraction of total higher education enrollment, they have become increasingly vital to higher education needs. For example, medical and dental training facilities are currently being utilized to capacity, but the number of physicians and dentists graduating yearly is not sufficient to maintain current standards of service to our increasing population. A 1958 report[1] submitted to Marion B. Folsom, former Secretary of the Department of Health, Education, and Welfare indicates that to maintain a satisfactory population-physician ratio of 757 to 1 the output of physicians would have to expand to 8,700 in 1970, or 1.900 over the 1956 output. The consultants submitting the report estimated that between 14 and 20 new medical schools will have to be built if the existing population-physician ratio is to be upheld. The financial cost involved here is great since the construction of a medical school requires a capital investment of between $35 and $50 million. The factor of urgency also enters into the consideration inasmuch as there is a lag of 10 years between the planning of a school and the population of the school s first graduating class. Contributing further to the need for medical training facilities is the need for dental schools. In this instance, the consultants estimated that even to re-establish the 1955 ratio of one dentist to each 1.900 persons would require the equivalent addition of two new dental schools each graduating 50 persons per year from 1957 to 1970.

In the research area, higher education has accepted the challenge to help push back the frontiers of new knowledge. Since the end of World War II, colleges and universities have increased their organized research activities tremendously. Approximately 20 percent of total education and general expenditures of colleges and universities in 1957-58 went toward the support of organized research. This is twice the percent so expended in 1945-46.[2] Although the major portion of these expenditures is underwritten by foundations, industry, and the Federal Government, the main burden of providing physical facilities needed to carry on research normally falls on the institutions themselves. Since organized research activities are expected to continue to increase, colleges and universities will have to devote a significant portion of their funds to equip, construct, and rehabilitate the facilities in which college and university researchers carry on their work.

In order to estimate the order of magnitude of special research and advanced training needs required over and above the growth assumed for increased enrollments, the Office of Education turned to studies and projections of physical plant needs made by several other agencies concerned with the fields of the medical arts, agriculture, engineering, and other science.[3] An evaluation and analysis of this material has led us to project an expenditure between now and 1970 of $3.083.000.000 to meet these special needs.

This estimate of need for slightly more than $3 billion for research and advanced training facilities is most conserative mainly because no data were available covering the facilities needed to provide advanced training for expanded staffing needs in institutions of higher education. Recognizing this further requirement, the Division of Higher Education. Office of Education began preparation of a paper setting forth estimated staffing needs for the next 10-years.[4] Preliminary estimates developed in this study show staffing needs between 1960-65 to be 127,000 replacements and 66,000 additions. For the 5-year period from 1965-66 through 1969-70, the replacement figure is 159,000 and that for additions is 116,000. It is evident that some additional facilities will be required to meet the demand for such large numbers of personnel requiring training at the graduate level.

Backlog of Needs

So far in this analysis we have confined our estimate to the amount of funds needed by colleges and universities to develop a physical plant of minimum adequacy to accommodate all the qualified students who will seek admission in 1970. Little or no mention has been made that the current situation is unsatisfactory and that a significant percentage of the nation's college buildings are overdue for repair, renovation, and replacement.

One of the most significant results of the study of colleg and university facilities being conducted by the Office of Education will be an inventory of all existing facilities as of the year ending December 31, 1957. Unfortunately, we have only preliminary results based on a sampling to refer to at this time. However, even the preliminary results of this inventory reveal some disturbing facts about the existing facilities available on the campuses of this nation.

The preliminary results of this statistical study[5] indicate that 15 percent of the college facilities first occupied between 1940 and 1957 are unsatisfactory and should be razed

This heavy rate of obsolescence is due largely to the acquisition by colleges of temporary buildings under the Government's surplus disposal program immediately following World War II. As stated previously, normal depreciation and obsolescence take their toll of all permanent facilities at a rate of about 2 percent a year. Make-do measures during the money shortages of the depression and the materials shortages of the war period produced a backlog of deferred replacements which cannot be indefinitely prolonged. This same statistical study indicates that 12 percent of the buildings occupied before 1901 and still in use in 1957 should be razed, that 17 percent of those occupied between 1901 and 1920 should be replaced, and that 5 percent of those occupied between 1921 and 1940 are obsolescent.

On the basis of an analysis of the data in this preliminary report, it has been determined that because of obsolescence and substandard conditions, 12.3 percent of the instructional and related buildings now on our campuses need to be replaced. In addition to the obsolete and substandard buildings, 9.8 percent of instructional and related buildings are presently in rundown condition and functionally obsolete. These need to be returned to satisfactory condition as soon as possible.

Projecting replacement, rehabilitation, and normal depreciation needs into the 1959-70 period on a basis comparable to that used for estimating new construction it is estimated that slightly more than $1.4 billion will be needed for instructional and related buildings. Adding this amount to those sums previously determined as needed for additional students and graduate and professional school facilities, we have a total need for $12.9 billion for instructional and related facilities for the period 1959 through 1970.

Residential Facilities Requirements

Our primary concern at this conference is the use and planning of instructional facilities in colleges and universities. Instruction in broad terms include research, and both of these areas must be supported by such general facilities as heating plants, auditoriums, shops, and administrative offices for a complete picture of instructional facilities requirements. However, it would be unrealistic for us to ignore completely residential facilities requirements at this time.

Although it might be easy to presume thatour colleges and universities could accommodate a given number of students in existing and newly constructed instructional buildings, the problem of determining would be dependent in many instances upon the availability of other facilities. For instance, in one college more students might be accommodated if additional residential facilities were available. In other instances, limiting factors might be food facilities, health facilities, or library facilities. A balance of facilities must be maintained.

The effect of these limiting factors may be illustrated by an independent survey made in the New England States.[6] It was found that although most of New England's colleges and universities had filled their freshman classes in the fall of 1958 and many had long waiting lists, over 2,000 instructional places were still available. Of 175 institutions reporting, 61 had such spaces available, but a majority of these were small colleges, 42 of them enrolling fewer than 500 students each. Most of these available spaces could have been utilized only by commuting students since the institutions reported only 597 available dormitory spaces.

Approaching the problem of residential requirements on as realistic a basis as that used in estimating instructional and related facilities needs, staff members in the Office of Education achieved a dollar estimate for residential needs. The aggregate of dollar needs arrived at for the period 1959 through 1970 was $5,973,784,510 (slightly less than $5.3 billion for facilities for additional students and $691 million for replacement rehabilitation, and normal depreciation). This amount added to instructional and related facilities needs increases the sum needed between now and 1970 to almost $19 billion.

Other Studies

The results of other research studies estimating the magnitude of the physical facilities problem in higher education show a range in the amount needed from $11.5 billion for the 1957-67 decade to $33 billion between now and 1970. A brief review of two of the best known of these studies may be helpful at this time to better judge the Office of Education estimate which I have outlined for you today.

A study made by Long and Black[7] for the American Council on Education projected 1957-58 enrollments to 1970 and, on the basis of this projection, estimated the additional physical plant facilities that would be required to accommodate the anticipated enrollments. The estimated enrollment increases overthe 3,027,029 figure of 1957-58 ranged from a low of 2,017,000 to a high of 2,851,000. The higher of these two figures would place total enrolment by 1970 at 5,878,000 students, which is lower than the projection of 6,006,000 students developed by the Office of Education. On the basis of these enrollment estimates and in terms of March 1958 construction cost dollars for a plant of minimum adequacy, Long and Black estimated a need for from $12 to $15 billion.

The Council for Financial Aid to Education in June 1959 released its study entitled "Nearing the Breakthrough"[8] in which it predicted that American colleges and universities would need approximately $11.5 billion worth of construction during the decade September 1957 to August 1967. This averages to an expenditure requirement of $1.15 billion a year, but it does not take into account deterioration of buildings and the cost of acquisition and improvement of sites.

Conclusion

We in the Office of Education realize that our projections will be superseded by more accurate estimates as new data become available. We believe, however, that the most reliable estimate available at this time is the one which indicates that colleges and universities have need for $12.9 billion for instructional and related facilities and about $6.0 billion for residential facilities between now and 1970. We acknowledge that many unmeasureable influences may turn out to have a marked effect upon these projections. Some may reduce facilities needs; others may increase those needs. We are hopeful that our efforts will lead to actions which may help solve some of the physical facilities problems of our colleges and universities. We know that you hold high hopes that the deliberations of this conference will make further contributions toward this objective.

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CAMPUS PLANNING:
GENERAL CONSIDERATIONS

Harold W. Lautner

Thank you Mr. Chairman and members of the conference. As our conference program points out, there are a variety of problems confronting colleges and universities that need planning and plans. However, the kind of problem and the kind of planning I shall talk about is that brought about in making physical land improvements. Perhaps as good a definition as any is that campus planning is concerned with determining specific uses for definite areas of land and the means of access and circulation so that structures and other improvements may be coordinated to produce a unified development that can be built economically, operated efficiently and maintained at normal expense. In other words, a campus plan is a well organized arrangement of land with appropriate treatment of ground forms upon which engineering and architectural structures are to be built.

After analysis of needs, what is really done in much of the planning of a campus is the bringing of certain kinds of problems and relationships down in scale to a two dimensional form where they can be studied and where orderly methods and imaginative skills can be applied. In discussing this part of the program with Dr. Jamrich, he thought it would be of interest if some of the elements that normally go into planning of a university campus were pointed out and discussed Some of you, I know, have had experience in this kind of planning or you may represent universities that haveplanning consultants or you may have your own planning offices. In the few minutes I have, I will make a number of general observations and then point out some of the elements in planning with the expectation that these comments may form the basis for a later discussion.

Considerations Preliminary to Campus Planning

One observation that I'd like to make is that I think campus planning is a part of a total planning process for an institution. Governing boards, administrative officials and the faculty must have reasonably well-formed goals in education before much can be done in the way of planning a physical, of the planning physical campus. A university has to know where it wants to go in an educational way at undergraduate and graduate levels. It must make some estimates of growth for its various colleges, divisions and departments. It has to know the part research will play in its teaching program. Less academic but just as important, it has to know what part of its student body it will want to or it may have to house and feed, and the kinds of housing facilities that will be necessary. These estimates in growth are a part of what I am calling a planning process and they are preliminary to planning the physical development of campus.

It was a personal experience several months ago to work with the University of Nigeria in West Africa on their new campus where the philosophy of the institution and the fields of study had not been finally fixed. nor was there a faculty. On the other hand. there was a great political urgency to start building the physical plant.

Although this situation has been partly corrected, this approach, I believe, would have resulted in fitting the complicated functions of a university into some buildings and their arrangement rather than fitting them to some specific function or use.

Campus Planning Needs Visibility

A second observation is that a university must organize itself in such a way that this part of the planning process has a definite place and can make a contribution. Planning must be adequately financed and responsiblity and authority for it must be clearly vested in an administrative office or department or in a consultant's office. Campus planning can not be done adequately by teaching or physical plant departments already loaded with other responsibilities.

There is a close parallel here with what might be said about the needs of planning for a city and the establishing of a city plan commission. It has been found that the offices of a city engineer or a building inspector are not favorable for producing a city plan. The exhibit of work here at this conference and printed planning reports of other universities, suggests that many of our colleges and universities have recognized the need of comprehensive plans and have made a place for analysis and for plan making.

Cost of Campus Planning

A third observation is on the cost of planning a campus. This will vary, of course, depending upon the size of the institution and by whom and how it is done. But however done, cost of plans for a university campus will be but a fraction of one percent of the cost of the total projected facilities. Whatever the cost has to be in a particular case, in view of the fact that on a new or expanding campus, millions of dollars worth of structures, of surface improvements and underground utilities are dependent for their layout and for their efficiency on a well developed comprehensive plan, it is difficult to see how an institution can afford not to have a well considered campus plan.

Open-Ended Plan

A fourth observation is that the plan for a campus is not static. Before the development of the city, of city planning commissions and departments about twenty-five years ago it was common for cities to employ city planning consultants for short-periods of time to produce plans and reports on how they felt their city should grow. Much of the time, under this one-shot method, plans were filed away, became out of date, and sometimes finally ignored. This can be just as true for plans for a university. A plan should be arrived at to serve as a framework for tying improvements together into an integrated development, but a plan has to be continually revised as changing conditions and trends or expectations warrant.

Elements of a Campus Plan

A final observation is that we often speak of a city plan or a campus plan as if there were a single plan involved. Actually there may be a number of component parts, not all of which can be brought together onto a single sheet of paper. This brings me to some short comments on just a few of the elements of the campus plan. If we look at the published plans of some of our universities or the excellent exhibits at this conference, we find that the component parts or elements may vary somewhat. Still, certain elements may be common to most of them.

Relationship to Community. One of the first considerations of planning for a campus is the relationship of the campus to the community. Any institution, no matter how large, is a part of a larger governmental unit and is surrounded by private or other public property in a city, township or county. Plans for a campus must recognize the relationship with these surrounding areas. The use of land or zoning, street systems, sewer systems, water supply, are some of the elements that may need to be planned with the adjacent community. I have here an exhibit to demonstrate this point, a plan of the physical environment of Michigan State University. The University is now not only touching the city of East Lansing, and we come very close to the zoning of that city, but we are now abutting the city of Lansing. The dark part of the diagram is what we think of as our academic campus and the lower part is the agricultural research area.

Existing Site Characteristics. The second element, I would say, would be the existing site characteristics. The character of the plan for a new campus or the projection of an existing one may be largely controlled by the topography of the site. It makes a real difference in planning whether there are stream beds or lakes or woodedareas and there can be much charm in using land in its natural features, just as they are found and by the way, it is more economical. In additions to an existing campus permanent buildings, well built roads and utilities all have to be accepted as they are and be made part of the larger plan. It is hard to say what makes a more difficult problem -- enlarging an existing campus with many fixed structures and traditions or planning an entirely new one with many questions and unknown answers.

Land Use. Third, is the use of land. One of the first planning decisions on the site itself, will be the use of land and the amounts needed for each use. The primary or academic area must be made large enough to include all the classrooms, laboratory and office buildings and such buildings as a library, administration building and auditorium. These buildings can be further organized in groupings in relation to the colleges or the division of which they are a part. Another area close to the academic area might be the area for intramural sports. Then there are living areas for thelocation of dormitories, student apartments and faculty housing. There can also be areas set aside for parks, for service, research, and other miscellaneous uses. Enough has been found out about the need for each of these uses so that four estimates can be made on the acreages needed for each one. The land-use plan of Michigan State University describes our academic area, surrounded by a rather large athletic or intramural area. Running through it is our Red Cedar River, a park-like open area. Also we have what we call our Circle Drive, enclosing sort of a "Holy Land" in the center of the campus which is left rather open. And then of course, around this complex are our dormitories and finally, on the outside, furthest out, are our apartments for married students.

Traffic Flow and Parking. A fourth element, I would say, would be major roads and walks. These need to connect not only every building on campus but walks sometimes must connect two or more building entrances. Neither the roads nor walks should give rise to dangerous intersections or walk crossing. A high degree of traffic safety can be brought about only by a minimum of automobile, bicycle, and pedestrian conflict. If a poor plan for the automobile and the pedestrian or the lack of a plan inherently generates conflict any college may only partially correct the problem. With students. automobiles and bicycles now counted by the thousands on our larger campuses, satisfaction must be found for their movement.

Automobile parking, I would say, would be another very important element. Probably no problem in physical planning has been so difficult to answer as the one presented by the automobile. Although we know what is required, there is often a reluctance to face theproblem. I think the problem arises from the fact that one hundred and sixty parked automobiles use up an acre. The trouble lies right in the simple statement that not many automobiles can be gotten on an acre of land. Costs of parking one automobile in a well developed parking lot may be approximately two hundred dollars, or over thirty-thousand dollars an acre. The cost of building a several story garage range from fifteen hundred to twenty-five hundred dollars or more per automobile stored. When practically all faculty and staff and one-third of the student body bring an automobile onto the campus, it requires either large and perhaps unavailable land areas or costly parking structures. Furthermore, it takes a well considered and compact arrangement of buildings, roads, and parking facilities to provide a satisfactory answer in a climate where we have an average of one hundred and forty-three days a year of rain or snow, and where for three months of the year the average mean temperatures are below freezing.

Open Areas. I'm mentioning last the element of planning for open space and lawn areas and tree and shrub forms but this is by no means the last element in importance. This element can be a valuable asset to a university and when one considers that on the Michigan State University campus for instance, about seventy percent of the land area is not covered by buildings, or roads, or parking area this is no small item. What is needed here is an early decision on the importance of what is commonly called the landscape and then consideration in a plan must be made for this outdoor development. This part of the planning must take into consideration the need for outdoor space for various school functions. Then there must be a full understanding of what is required to grow trees, appropriate shrub masses and fine lawns. Here we are dealing with living and growing things where time and daily maintenance are vital factors. No matter how much money is available. it takes three to five years to get a good lawn and ten to twenty years to develop a small tree. Like the other elements. a plan of open areas and planting must be an integral part of the plan for a campus.

CAMPUS PLANNING:

A CASE STUDY

Henry DeWitt

I call this a "Case Study" because that is just what it is. I do not purport to be any kind of expert or authority in this matter of campus planning. However, by reason of my position at Calvin College and Seminary, I have shared in the countless hours of discussions and deliberations that have led to the decision to develop an entirely new campus for the institution and offer the present campus for sale. I will attempt to outline the problems with which we were faced, explain the various factors we took into consideration in proposing solutions, and present to you our Master Campus Plan by means of a few colored slides. I have also had passed out several exhibits which I hope will help to make this case study a little more real to you. (Exhibits not included in this report. Ed.)

The facts which confronted the Long-Range Planning Committee in 1956 were these.

1. The enrollment of the College was 1600, that of the Seminary was 120.
2. All indications pointed to an increase in the College enrollment at the rate of at least 100 per year.
3. The present ten-acre campus had no logical area for additional construction and the six buildings on the campus were built to accommodate about 1400 students.
4. A seven-acre site purchased several years before for expansion was separated from the main campus by a two-block residential area consisting of 52 homes.
5. There was a pressing need for additional student housing, added classrooms, a music building, and a gymnasium.

The Science Building, the Commons Building, and a sizable addition to the Library were all completed within the last decade. You may wonder why this was done when it should have been evident that, even with the additional seven acres, there was relatively little room left for future expansion. Without wanting to sound facetious, it could have something to do with the fact that at the time we had a Planning Committee instead of a Long-Range Planning Committee. There is a considerable difference between providing for the immediate needs, without any thought of the problem to be faced by future generations, and planning so as to take care of both the immediate and the future needs. Actually, the plan was to build dormitories and a gymnasium on the East campus and then gradually purchase the 52 pieces of property between the two campuses for additional academic buildings.

When the present Committee was appointed in 1956, its members just assumed they would follow this proposed scheme. However, it was thought wise to project the total cost of expanding in the present area before starting construction, so that these figures might be available for promotion purposes. So we proceeded to contact each of the 52 home owners to get their reaction to our proposed purchase of their residences and a statement as to their suggested sales price. Naturally, being a private institution we do not have the right of condemnation and hence had to rely on the goodwill of these persons. In our questionnaire we asked how many would be willing to sell on the basis of an independent appraiser's determination. Many responded favorably. However, some stated unequivocally that they would never want to sell and others that they would sell at a price two or three times the fair market value. In short, to buy these ten acres, which we would need as a minimum for adequate expansion, would cost us in excess of a million dollars. Even then we would not be able to provide for adequate outdoor athletic facilities and would be pressed for parking area. Hence, a complete halt was called to the various projects that were on the drawing boards at the time and the Committee was directed to make a complete study of the problem.

One of the early recommendations made to and within the Committee was to limit the enrollment to about 1500 students, these to be selected on the basis of superior high school records. I understand some colleges have solved their expansion problem in this fashion. It sounds like a delightful solution. However, in the case of Calvin College and Seminary this proposal was not practical. The financial ties between Calvin and the denomination supporting her are still very strong. As a matter of fact, we receive fifty percent of our annual operating funds through direct church support. This would certainly be endangered if we began informing some of the parents who had contributed so faithfully over the years that there was no room for their sons and daughters. Hence, this proposal was vetoed.

Having decided to continue accepting students on the basis the present standards, the next step in the Committee's study the determination of some ultimate enrollment figure. By ultimate" was meant the somewhat arbitrary date of 1970. By fully charting our growth pattern for the previous several s, taking into consideration the enrollment in high schools elementary schools, allowing for an increase in collegemindedness, assessing the affect of birth rate statistics, and studying enrollment projections made by other educational organizations, we arrived at the range of 3,000 to 5,000 as our potential. Not only was this done in total but was projected as to sex, by area of academic interest, and by boarding or non-boarding students. We found that our enrollment tends to run 60% male and 40% female, and that about 37% of our student body are daily commuters. Assuming (1) classroom utilization in the same degree which we were using at the time (about 34 hours per week), (2) that we would want to house at least seventy-five percent of our out-of-town students, and (3) that we would want to provide adequate music, physical education, and student center facilities in addition to our presnet facilities, the Committee was in a position to determine the total amount of areas required.

Incidentally, since 1956, we have changed our opinion on some of these factors through additional experience. For example, this past year we used most of our classrooms to capacity from 8:00 a.m. till 4:00 p.m. as well as on Saturday mornings. This is a total of 44 hours per week. Although this kind of program would have been considered intolerable a decade ago, it has been accepted with very little adverse comment. By operating a compact campus as we do now, and using the plant more than 40 hours per week, we have discovered that our total plant operating costs (janitor's wages, utilities, maintenance, supplies, etc.) amount to less than 8% of our budget. This is gratifying. We hope to retain an emphasis on this factor in planning our facilities on the new campus.

Basically, at this stage, there were two alternatives left for the Committee: (1) use the East campus for parking and additional academic facilities and proceed to find other vacant areas within a radius of one or two miles on which to construct dormitories and the physical education plant, or (2) find a large site in the general Grand Rapids area on which all new facilities would be built and to which it would be hoped the entire operation could be moved eventually. The first alternative would have the advantage of retaining the buildings and the neighborhood in which so much of the School's history had been written and would obviate the necessity of disposing of our present property. However, it would commit us once and for all to split campus with all its inherent inefficiencies of operation, to say nothing of the inconveniences of having dormitories and probably physical education plant moved some distance from the central campus.

And so it was that the Committee recommended and the Board adopted the plan to move the College and Seminary to a new campus. The general procedure suggested to accomplish this was: phase 1. move the Seminary to the new campus, thus making the present seminary building available for College purposes; phase 2. construct sufficient dormitory and classroom units to accommodate the Freshmen on the new campus; phase 3, construct additional dormitory and classroom units to accommondate the sophomore class, plus a gymnasium; final phase, which would take place if and when the present campus is sold, construct the remaining facilities required to round out the campus. The maximum distance that the new site should be from the present campus would have to be determined with this program in mind.

The three properties on which we were able to obtain options and which we presented to the Board of Trustees for actions were all within four miles of the present campus, all were very buildable sites, and varied in size from 120 acres to 166 acres. The site selected was the one at Burton Street and the East Beltline. The reasons sited in the Committee's recommendation of this site were:

1. The size, topography and existing improvements and landscaping offered the best opportunities for effective site planning.

2. Access from the periphery of the site is possible on all four sides, making for great flexibility and convenience.

3. The value of the existing improvements in buildings, landscaping, roads, etc., made the purchase price most attractive.

4. The immediate neighborhood environment is excellent and definitely superior to theother two sites.

5 Cost of site development should be materially lower than the other two sites in view of existing improvements and the condition of the land as it now exists.

The principal disadvantage was the fact that this site was the greatest distance from the city limits and thus would present somewhat of a problem as to obtaining city utilities.

As I stated previously, phase 1 of the move was to erect a Seminary Building on the new site. There were several reasons for this: (1) the Seminary could be moved as a unit for it does not depend to any great extent on the campus auxiliary services such as housing and dining; (2) the College needed the use of that building desperately for its operations; and (3) the Church fathers had decided to celebrate the centennial of the denomination by asking for donations for a new Seminary Building. However, even though that decision had been made, it was immediately apparent that the placing of this structure could not be done until a complete Master Plan had been developed, for obviously acreage could be set aside for the Seminary only after the area needs of all proposed units had been carefully reviewed and related one to another. I am sure you have heard the comment made on various campuses, "If only we could have planned this from scratch, we surely would not have come up with this assortment of buildings." However, when faced with the opportunity, the challenge is a bit frightening.

The Committee soon decided that developing a Master Plan was no job for amateurs. We needed professional advice, not only in proposing a basic layout but also in designing buildings over the years that would fit in with the original concept. There were three competent local architectural firms who had done work on our present campus, were alumni of the College and were still closely identified with it. We proposed the formation of an architectural team of these three firms who, along with some professional campus planner we expected to find, would be responsbile for developing a Master Plan. However, these firms suggested that we add a fourth architectural firm to the team, one with campus planning experience and one which could be expected to spearhead the design function of the campus as a whole and each individual building. The firm of Perkins and Will was selected from several nominees. We hope by this method to achieve a continuity of design throughout the development program. All firms will sit in on the programming and design stages of each phase but this will be primarily the responsibility of Perkins and Will. After a particular building has been programmed and designed, it will be turned over to one of the local architects who will carry out the blueprinting and supervising services. The normal fee is shared by the various architects involved. Our first building, a $700,000 Seminary Building, is now being completed and this arrangement has proved to be very workable.

The first step in pinpointing areas on the new campus was to find a site for the seminary Building. This came easy, for the Southeatern corner of the new campus was a natural spot. It provided a distinctly separate but yet contiguous setting.

That having been decided, the question arose as to the criteria to be used in placing the college buildings. To aid the architects and the Committee, the Administration and Faculty drew up a list of ten points to be used as guides in the developing of a Master Campus Plan. They are:

1. the ideal of integration and one-ness of all knowledge
2. the correlation of three most important phases--academic, library, chapel--to indicate a Christian Liberal Arts College
3. a community of scholars
4. togetherness of administration of teaching
5. faculty-student-classroom orientation as opposed to student-faculty-social situation
6. a prominent, serviceable library
7. economy of operation
8. effective traffic control
9. flexibility of pattern--open-ended

10. the full development of the individual student

After many long hours and an almost infinite number and variety of proposals, we have come up with what we think is a Master Plan that fits the criteria we had established, and we, as a staff, are anticipating eagerly the realization of the Master Plan.

(Editor's Note: At this point, Mr. DeWitt presented a series of colored slides which served to illustrate the above remarks.)

CAMPUS PLANNING:
A REVIEW OF THE GENERAL DISCUSSION

Herbert R. Hengst

Several significant questions were raised in the spirited and pleasant discussion that followed the presentations of Lautner and DeWitt on Campus Planning. To review them briefly hardly does justice to the service the discussion performed for the conferees. However, a short paragraph about each of several major questions that were raised might serve as summary statements.

The discussion period was begun by a series of questions directed to Mr. DeWitt concerning the presentation he had just concluded. Mr. DeWitt was querried about such items of concern as the timing of the move to the new campus, the anticipated total cost of the new campus, the nature of the support (financial) which made possible the new development, and the question of possible future expansion on the new site.

The latter concern was expressed and talked to by several members of the conference. There was serious attention given to the problem of determining ultimate sizes for colleges and universities. It had appeared from several earlier comments that such estimates were integral parts of the planning procedure. The question seemed to ask, what about planning beyond the ultimate? -or, more basically, should we determine fixed ultimate or desireable sizes? The nature of such ultimate sizes always appeared as enrollment figures. The problem posed by the question was related to several pertinent considerations: (1) our present concept of an integrated institution, which does impose limitations; (2)

the availability of properly located sites for large institutions, as well as the implications for individual students of great physical size. It was suggested that perhaps we might re-examine the atomistic concept of the university as a means of serving the needs of vast numbers of students without at the same time becoming overwhelmed by sheer physical size. Another similar suggestion dealt with a decentralized institutional organization, in which smaller units withinthe complex of the university would serve in nearly complete autonomy.

Discussion of the problem of ultimate size led directly to the next major concern of the group: which is more economical (or more costly) the expansion of an existing campus ad infinitum, or at least to great proportions, or the development of completely new campuses? A serious objection to large institutions was registered at this point, on the grounds that the proliferation and distribution of colleges throughout the society had a salutory effect on the culture, while the continued growth of given university centers within a restricted geographic area teneded to promote further isolation of higher education from society in general. However, the question of relative costs involved in the expansion of existing or the development of new campuses was resolved in terms of the following recommendation: after a certain size of maximum efficiency, both economically and educationally, had been exceeded, it was adviseable to develop new campuses. It was suggested also that many factors, such as the location of the existing campus, the total cost of education to the student due to present location, the nature of the stu dent body, etc., were all variables that effected the determination of the "maximum efficient size."

Quite appropriately, the final question discussed during the evening session dealt with considering the technological advanced which could seriously alter patterns of living that currently influence our concept of campus planning. Mr. Lautner indicated that campus planners are vitally concerned with such developments, and with incorporating such concern in plans for expansion and development of campuses. Dr. Jamrich reported a research proposal that would have involved a completely automated instructional program for a selected group of students without the traditional classrooms-lecture-dormitory concept of a campus utilized. Mr. Rork reported that the U.S. Office of Education had received a proposal which envisioned the use of surplus government ships as floating campuses. Another participant reported the experimental work with moving sidewalks to speed the transportation of students between facilities on larger campuses. Mention was also made of the increased interest in and development of teaching machines. It was generally concluded that campus planning in the immediate and long-range future must provide for enough flexibility to accommodate such advances as are made available to higher education by the technological genius of our age.

THE FUNCTION OF ARCHITECTURE IN HIGHER EDUCATION

William Brubaker

The character of an institution of higher learning is strongly influenced by its architecture; therefore, the character of its architecture should be determined thoughtfully by the institution. Winston Churchill will be remembered for his comment on architecture: "We shape our buildings, then our buildings shape us."

You cannot work in, or study, or visit an institution of higher learning without your every action being influenced by the architecture--it can help you or hinder you--it can inspire or inhibit--it can be responsbile for your comfort or discomfort. Architecture can create an atmosphere of dignity and decorum of excitement and enterprise, or of anticipated adventure and discovery. Also, you cannot think of any college of university without visualizing its architecture. We may, therefore, say that a function of architecture in higher education is to help establish the character of the institution. The reputation of the Air Force Academy to date (the "corporate image" to our citizens) is very strongly established by its architecture. Fort Wayne's Concordia Senior College, built at the same time, gives us the impression of an institution at the opposite pole. The University of Chicago is incomprehensible to us in any other location; Denison is Denison; the University of Virginia would mean something else to us without its library and mall; Florida Southernis knownprimarily for its Frank Lloyd

Wright buildings; without its tower library and tile roofs the University of Texas would seem to be characterless.

Colleges and universities, at least those we remember most clearly, shape themselves with plans, then buildings, and then the buildings and spaces between become their trade marks, and scholarship does not change these indelible marks.

Let us consider the Air Force Academy at the base of the Rocky Mountains in Colorado Springs. The site is breathtaking. Architects Skidmore, Owings, Merrill raised a monumental plateau, and from its perimeter the academy buildings rise. From this man-made plateau, one sees the mountains to the west and the vast plains sweeping to the east. Buildings are huge, slick, dramatic metal and glass creations expressing a highly developed technology. Cadets cut square corners and walk only on the white marble gridiron pattern as they cross the plateau from building to building. It is a sensational walk. One should understand the function of architecture here. The aim of this particular institution is the training and conditioning of young men who will not only direct our war machine but will be our ambassadors throughout the world.

Now let us consider another brand new institution of higher learning. This one, in contrast to the Air Force Academy, is exceptional in its warm friendly, dignified and serene design, and the function of architecture is clearly state: " . . the creation of an environment appropriate to the intellectual and spiritual training of young men who would go on to professional studies in theology." Concordia Senior College (Lutheran Church, Missouri

Synod) is a tranquil village-like group of rather small buildings on rolling wooded land just north of Fort Wayne, Indiana. Architect Eero Saarinen gave the twenty-five buildings low-pitched roofs, as would be found in a north European village. Student housing is delighful. Thirty-six students live together in residences that are no larger than a large house - this for greater self-responsibility and student government and good human scale. The only dramatic building is the chapel as the center on the highest point. It is a great symbol, spiritual and dominant. Again, the function of architecture here is clear: "...an environment appropriate to intellectual and spiritual training."

Therefore, in planning educational facilities, it is indeed proper for us to consider the psychological aspects of environment and how architectural design as a fine art (in addition to being a technical science) uses space, form and texture, light, color and acoustic to determine what we see and feel and hear. Forms and spaces have wondrous powers to lift the spirit, to satisfy the mind, and to accomodate the body.

Architecture has been described as a "beautiful game of space." Obviously, there is more involved than simply satisfying technical and physical program requirements, for space is what we live in indoors and outdoors and it effects our every thought and emotion. We must not think in terms of plan alone - space is three dimensional.Indoors the third dimension may be the ceiling, outdoors the branches of trees. Changes in ceiling heights are important. Think of the fine library reading rooms you have experienced where, coming in from low-ceiling reception rooms, you move forward into the higher area of a big room. The height is multiplied by your imagination. Space perception is never absolute, but the product of contrast. In considering this entry into a library we unavoidably added another dimension - time and movement. We move, we see and experience space from different points at different times. Architecture must be studied in sequence - impressions must be recorded motion-picture style. For this reason, still photographs of buildings are deceiving, and are seldom truly representative.

Let us say a word or two about light. We have too often, very recently, been trapped into considering intensity alone, that is, the number of footcandles. Adding more footcandles doesn't necessarily solve a lighting problem. Light has many other qualities, color, contrast, direction, distribution, and source. We have a whole range of conditions subject to the controls of design. Have you experienced a classroom with a "ceiling of light?" The effect can be disturbing. Without direction, without character, a bland environment results with no shadows no highlights, no form. Contrast this with what you normally seek at home. You use floor and table lamps to create pools of light for variety and interest. Candlelight in the dining room intensifies the effect; the candles' point sources of illumination make silverware and glassware and the ladies eyes sparkle. In such an environment, human relationships are easy, relaxed and gay. The art of Architecture includes thousands of such factors.

Also, let's acknowledge acoustics as another aesthetic tool responsible for environment. You know the sounds of an open yard, the reverberations of a tiled locker room, the quiet of a carpeted lounge. This is a reminder that acoustics, too, have an emotional impact, and acoustics are subject to control by the designer. We can supress and magnify sound, we can direct it and reflect it, we can selectively modify it by absorption. It is a part of the artist's palette. At times a highly reverberant situation is good as in an arena for athletic events where excitement and tension are objectives. We are all in favor of true quiet at times. But a medium noise level, properly handled, can be useful to mask out individual noises in offices and labs. The overall noise level (as in a banking room) can act as an "acoustical perfume" to cover up the sound of individual conversations.

Having barely introduced this subject of factors in architecture only to remind you that much more is involved in design than just square feet and equipment. we must move on. and remember. too. that not only buildings but the spaces between buildings are important. in fact. often more important to the character of an institution than are the buildings themselves. The heights of walls. the trees. shrubbery and lawns. the shape of the land. paving and pools - the spaces between buildings - establish the character of an institution of higher education. Harvard is a good example. The buildings are of all ages and of all styles: there is no standard building design since the policy there has always been to build in manner most logical for the times (in other words they have always built "contemporary" buildings). And very few of the buildings are. or were ever considered to be "jewels." But we all like the campus. What do we like exactly? We like the spaces between the buildings - the Harvard Yard, the trees, walks, benches, the walls, the shape of the land and the human scale.

Ohio State University also has many unrelated types of buildings on the campus, but not warmth, not the appeal of Harvard, not the splendid strolls. The spaces between buildings, determined years ago but still there every day,were not so skillfully planned. One has the feeling that "planning" consisted of "putting" buildings wherever spots were available. The effect is spotty.

Are we still talking about "Architecture?" We most certainly are. If you wish you may add "long range institutional planning" and "campus planning" and "landscape architecture." They all work together, and even though our attentions must for a time be concentrated on one particular building project, we must continue to consider the spaces around that building, the neighborhood, the institution as a whole, and it has become so apparent recently we must consider even the city and the region. Here is a quick example: notice how the University of Chicago is interested in and is re-vitalizing and encouraging the re-building of the entire surrounding neighborhood, for the health of the university.

In residences for students, the function of architecture is pronounced. Many college residences have become military-like dormitories with long central halls lined on both sides with rooms. Are such cells consistent with the aims of higher education?

College president Henry Wriston in his excellent book, *Academic Procession*, justifies the cell-like nature of dormitories by believing that the student's intellectual life has almost no privacy elsewhere. Therefore, dormitories should consist of single rooms where the individual has an opportunity for solitude and, presumably, thought. But it does not follow that such buildings should be mean.

What do studentslike? Harvard again provides a convenient example. Students do warm up to the new and modern Graduate Yard where dignified three and four floor dormitories are composed around a central yard. But students moving in from some of the older buildings like Lowell House are dissatisfied with the minimal character of the newer facilities. Old Lowell House gave four (wasn't it?) students a living room with a fireplace and a private entrance, with bedrooms grouped around. Such facilities are seldom considered now, even at Harvard. It seems we have progressed to the hotel-type cell.

Who is the villian? High building costsusually get all the credit. But how about the inflexible methods of financing we've saddled ourselves with? HHFA loans bind all institutions to just about the same "efficient" HHFA rules. The function of architecture can be supplanted by the expediency of financing.

(Now don't worry; I can be "realistic" and "practical" too - but a lot of us had better take the otherside, the dreamer's side, sometimes ...)

We must ask more often whether the "optimistic and humane" enterprise of higher education, which has no product except people, should strive quite so hard to reduce to minimum space and minimum cost the places where students will live for years.

To repeat: too many residences have been built too cheaply - they will always be mean, will become dirty, will repel students, will cost too much to maintain, will fail to contribute to the mental and spiritual development of the students, and they will be torn down too soon because they are ugly. Therefore, in the end, they will have failed to produce their one original goal - economy.

The question of operating costs very properly comes up often these days. You tell me that operating cost can be more of a problem than original capital costs. After all, who wants to give money for sweeping out every day and repairing plumbing? This gives us the correct motive for efficiency in facilities - efficiency is worth striving for when it does save operating costs. Since you are subjected to so much pressure for cheapness this is hard to accept, but you do not want a lot of cheap space if it is not used fully. You need less new space, better quality space, space with a longer maintenance-free life (though equipment will come and go). You need flexible, adaptable space that will be used more hours per day, space that is so agreeable that everyone will want to use it and will be able to use it.

What is true economy? Is it not true that the greatest economy is to build well and build beautifully? Larry Perkins has repeated his position for years - that a beautiful building, sensitive to the emotional needs of the humans who use it, and one that serves well the physical functions set for it, is the truly economical building. "Buildings do not fall down; they are torn down. Ugly buildings are torn down long before their physical usefulness has ended. The more beautiful will last longer, be loved and cared for, and the beautiful will make the greatest contribution to the job of education."

Hear of a splendid example of a university building that is today 102 years old and still provides the finest kind of instructional facilities. Boylston Hall, built in 1858 in the Harvard Yard. has granite walls two feet thick. Through the years, as needs changed, the building was altered for various uses. and parts of it wore out. Then in 1959, at age 101. saving only the shell and structure, Boylston Hall was completely remodeled, was air conditioned. re-wired, re-piped - the end result being "new" classrooms. offices. and a fine lecture hall which all have more character and cost less than a new building. So - for 102 years Architecture. instead of mere building. influenced the higher education of individuals favorably. and the university achieved true economy.

W. W Rostow in The Stages of Economic Growth explains that we in the United States are in an age of high mass-consuption. With many of the problems of economic growth behind us. and being technically mature. we are confronted with the need for choosing how our increased resources shall be used. He suggests three possibilities: (1) we can increase our influence throughout the world through military expenditures and foreign aid. (2) we can achieve the objectives of the welfare state (for instance.

the shorter work week,) or (3) we can increase consumption which means more and better food, shelter, and clothing.

We are not quite so "affluent" that we can achieve all objectives. The element of scarcity still makes us choose and allot.

Here's the point. Higher Education - and the physical plant for higher education -- is dependent upon these economic choices. When someone says "we can't afford it" he really means "we don't want to!"

Well, here we are in 1960. Where do we go from here?

Beyond good engineering, beyond sound planning and sound economy, beyond satisfying all-important program requirements, just what is worth striving for?

What will the next generations think we did right?

We should strive for character. We should strive for regional character appropriate to the culture of the province. We should strive for indigenous architecture evolved naturally from the facts of site, climate and materials. We should strive for personal architecture, accepting the fact that a good building is conceived by an individual or a small team of individuals, and this gives our building a degree of uniqueness. Finally, we should strive for architecture in our institutions of higher education that inspires - and helps to develop the character of individual students.

(EditorsNote: At this point, Mr. Brubaker turned to a series of sketch boards and illustrated the following ten points as he presented them)

1. Build truly adaptable buildings which can serve highly specialized needs. Suggests clear floor areas (flexible) plus concentrated utility areas (inflexible.)

2. Adopt Dr. Archibald Shaw's 50%-for-building 50%-for-equipment policy. Expect extra long building life (the shell) but expect equipment to wear out.

3. Design should permit not only interior re-development periodically, but should allow horizontal (or tertical) expansion in various increments of space.

4. Plan attenuated groups of buildings (clusters, linked groups, etc.) instead of isolatedone-department buildings which are inflexible in programming.

5. Acknowledge need for broader-scale planning-with community and regional groups - especially since the line between "going to school" and working is blurring.

6. Growth of institution doesn't necessarily mean growth in one spot. Consider not only jumps to new location, but a "lineal campus" 5 miles or 50 miles long along a transportation artery, consistent with the strip-city concept.

7. Unify campuses split by traffic - by building over streets and expressways. A "bridge" by nature ties areas together.

8. Consider a two-level base, from which buildings rise. Traffic-parking-services below, with people-gardens-terraces above.

9. As land values increase, building into the air and below the normal ground level becomes reasonable. "Machine component" underground can also be survival unit.

10. Balance these tendencies toward bigness, massism, and mechanization with intensified interest in the needs of the individual and good human scale.

A DISCUSSION AND SOME REACTIONS

The Reaction Panel section of the conference was designed to stimulate and solicit ideas from all participants. It followed Mr. Brubaker's remarks. Dr. Floyd Parker served as moderator of the panel, which included Bruce Smith, Harold Dahnke, Karl Hereford, and Herbert Hengst.

Several significant problems were raised and discussed. Dr. Dahnke touched a responsive chord in his introductory statement.

DAHNKE:

> I think the major question I have up to this point in terms of this conference is that precious little has been said about educational objectives. It seems to me the space utilization experts are ready to solve the problems for us, and the architects are ready. But are we sure we have the faculty with us? Does the faculty have anything to say about this road that we're going to travel? This is my question.

Mr. Smith identified a similar concern when he raised a question about the "character" of institutions of higher education.

SMITH:

> My question is not necessarily how can the colleges and universities decide what their character should be as expressed in their campuses, but can they even do it? I'm not sure that we're equipped at this time to even make a sensible determination of what this character should be.

The concern about determining educational objectives or identifying something to express the character of a college or university was pointed out again in the question Dr. Hereford put before the conference.

HEREFORD:

> I wonder, though, just as Bruce has already pointed out, about the possibilities of any faculty or any administration in the college deliberately setting forth to create

> a character. I know in our shop we talk about seeking greatness in some elements,but it's been my experience that greatness generally comes around as much by accident as by foresight and planning. But the thing that really disturbs me is the role of the administrator in the educational planning of college.

In his introductory remarks, Hengst seemed to express not the concern of determining objectives, but rather the question of developing colleges and universities to enchance the worth of the individual.

HENGST:

> Our culture seems to value individualness or individuality. How do we provide for this and at the same time take advantage of the technical advances that are available to this age and will be even more readily available in the years ahead?

Dr. Parker referred the questions to Mr. Brubaker for comment before calling for responses from the floor. Using this opportunity. Brubaker highlighted the need for maintaining or creating a "human scale" as a means of expressing objectives and promoting "individualism."

BRUBAKER:

> There are some rather senstive critics around who have missed the question of bigness. I'm reacting to the comments that our problem seems to be this too often. Too often planning in large complexes involves vast structures with nothing between. Now, this often has been sort of a reaction to the thing we see in slum areas where everything is built up and there's no greenery. no trees, no vines on buildings or anything. so there's been sort of a reaction, in rebuilding. to think in terms of these vast projects with nothing but grass and trees between. This seems to be the sort of thing that's deadly when it comes to walking around as a person. not driving in a car but walking from one building to another, passing nothing but paving and trees What you'd really prefer in public housing. for instance. are some shops. or little places. or drugstores to pass. perhaps windows to look into. You're either going by this big unit or you're going by the vast nothingness between. These are matters of human scale

BRUBAKER: (continued)

> and this is where we can fall down. I'm not suggesting a solution there, I m merely restating the problem again.

Following these opening questions and comments. Parker turned to the floor. from which came a rather direct frasing of a basic concern. The general problem dealing with the role of the architect in campus planning was first raised by Mr. Joseph Prochaska, Assistant Professor of Urban Planning, Michigan State University. He stated the concern succintly " . . basically. I think I distrust most architects."

He concluded by posing the issue:

PROCHASKA:

> Well. I think basically my question deals with welding architecture into its proper place so that it serves the community or the university. The university or the community does not serve architecture.

There were many reactions to this comment. Brubaker suggested that good architecture would not be serving itself primarily. even though it was successful in producing a facility that was monumental. He demonstrated that total campus planning should insure but one great structure, which expressed the character and objectives of the institutions. The example he brought to the group was most interesting.

BRUBAKER:

> Think of a building that you really like on a university campus. one that's a gem. one that works well and is beautiful and is good and great. I hope you each have at least onelike that on your campus. It would be impossible to achieve that kind of greatness all over the campus. One here. here. here, a whole row of gems. It would be a Worlds Fair atmosphere if you did that There's something that you have to achieve and it s pretty difficult to do and it has to be considered very carefully but some buildings on a campus should not be

BRUBAKER: (continued)

> classified as great and you shouldn't strive, you shouldn't get involved in structural gymnastics or any kind of unusual architecture on many buildings. Some of these buildings should be neutral in character and should serve as a background for the thing really counts. Now I think Concordia College does this. There are twenty-five low buildings with one dramatic chapel. At Concordia the chapel is the important symbol and if you use the word 'gimmick' - I don't happen to like that word but if that's how you want to think of the dramatic effect of the Chapel, O.K. - but it's very successful and if the architect's reputation happens to be enchanced by it, all right - but it does a marvelous job for that campus. It would be a terrible mistake if the library was as dramatic as the chapel and if the student union was and the gym. This is where you can really fall flat on your face.

The other architect on the panel, Mr. Smith, was also given an opportunity to comment on the question raised by Mr. Prochaska. Interestingly enough, he tended to agree that a basis of distrust perhaps existed, and responded with a challenge to educators about the quality of their educational planning.

SMITH:

> Like Bill, I agree with the basic thought that Joe has expressed, but disagree heartily with some of his details. I think that the thing that underlies all of the various phases of the problem that we've been talking about is the fact that the buildings must not be a monument to a university either. The whole existence of the university, the existence of the faculty, the existence of the building is only valid in so far as it influences the people who pass through it and if it's orientated toward any other purpose it is a terrible mistake. I think that undoubtedly, architects have made some tragic mistakes in buildings on many campuses. I think that most of the things that would cause a so-called monument to an architect would go back to the fact that there was little else to guide the creation of the building other than that so many square feet were needed to house so many people for so many hours a day. Nothing more substantial than that to guide the program.

Richard I. Hammel, an architect representing Hammel and Green of St. Paul, Minnesota, contributed an interesting observation in defense of the architect

HAMMEL:

> I think probably the reason that many faculty members or educators distrust architects is because the architects are so much better organized than educators are. We try particularly to know what we're going to do or want to do but the client very rarely knows what he wants to do. I insist that it takes two parties to build a building, a good architect and a good client. I feel that the good client does not very often appear on the scene. He does not know what he is doing, he doesn't know what he needs to do it with, how often he wants to do it, nor in what kind of conditions he wants to do it. He can not express himself in the kind of terms necessary to direct the architect in creating an acceptable building. Because of the inability on the part of the client, frequently he doesn't act as a client anymore. He acts as a kind of slave saying how much money do you need to do this thing? He does not control the process. He fails to recognize that the architect is his servant and to be doing something which he himself wants to do, not that the architect wants.

The discussion then turned to examining the role of the educator, both the administrator, as Hereford had previously suggested, and the faculty, in the planning of college and university facilities. Parker called on Dahnke to comment on faculty functions.

DAHNKE:

> Now, I think if we're going to try to build general purpose space, then the people who are working with the architects and I think this supports the previous point, have to have some feeling for where the faculty is going. Ultimately this means that we get back to saying what our educational objectives are. Where is this university, where is this college, going? What does it intend to do? Not just for today but for five years or for ten years. I think we have to get down to specifying what it is that we are as a university, what is this that we're talking about. What I'm saying is, I think the architects are ready for us but I'm not sure the educators are ready for the architects.

Dahnke's remarks were continued and expanded by Hereford who identified more specifically the functions of the faculty in terms of involvement in the planning process.

HEREFORD:

> Harold, I'd like to take issue with just one or two points. Basically, I'm very much in sympathy with your point of view, I think I would want the president of a university and the body of the faculty of the university, and the board of trustees to give the educational intent and purpose of the institution. And arguing from that point of view, then I would expect my faculty participation to give as much as it gets so that what I would really want from the leadership then is not a solution but a process of planning which I, as a faculty member and my colleagues, regardless of the fact that we are a community of strangers in many instances and are ill-equipped to deal with problems of curriculum development because of our own individual specialities, I would really want a leadership which would involve me in a process which would confront me with purposes and problems.
>
> It's within this framework that I think I can transcend the limitations as a human being and as a professional person with which my own training surrounds me. Short of this kind of challenge I think the involvement of staff can only result in two things; superficial answers or a hodge-podge facility. The pooling of opinion among faculty at any given time can not produce the kind of planning data which I think insightful architects and insightful educational planners can deduce from the raw material for a really genuine solution. But again, the challenge as I would see it, is for the kind of leadership which transcends themoment so that we can really come to grips with the problem.

But the architects were not allowed to escape their share of responsibility, in spite of the recognition by Dahnke and Hereford of the inadequacies of faculty and administrators. Dr. Jamrich gave voice to a feeling shared by many of the participants and furnished a specific example.

JAMRICH:

> Let me be very specific about what I think has aroused some criticism and suspicion about architects at least in my own mind.

JAMRICH (continued)

> The other day I picked up a planning guide an architect had prepared for a library. The very first line said that this library should have fifty-seven books per student, and therefore with X-hundred students you will need so many square feet per stack. The thing proceeded in such a sterile fashion that it disrupts my thinking about the very point Harold is making. The faculty may have a difficult time of identifying what it is that they ought to be doing and the manner that they ought to be doing it in. But I still say that we can approach the planning of buildings like the library with a little more imagination than deciding that there ought to be a ratio of fifty-seven books to each student. And I say that any architect who proposes that kind of thing is open to suspect from an educational point of view.
>
> All I'm saying is that apparently many architects are not prepared with the educational point of view and insight that should be translated into the buildings which will give rise to educational institutions.

An unidentified participant made a suggest for resolving the problem. His recommended course of action envisioned the establishment of planning offices within every college and university that included both educational planners and architects.

UNIDENTIFIED PARTICIPANT:

> I can fight for both sides. I'm an architect and in the university administration in the planning department. And I'll disagree with Mr. Hereford that faculties don't know what they need. It takes more time to develop, more time than a practicing architect can usually devote to the process. But being employed in the planning department for this purpose I can take the time to find what the faculties need. It's a different approach which more universities should adopt. A few are. A few have planning offices with architects in it as well asmen who represent educational point of view.

With this thought, the general discussion on the roles of the architect and the educator in educational planning was brought to a conclusion by chairman Parker.

Parker then proceeded to call upon two distinguished participants in the conference for their reactions and comments. Dr. Archibald Shaw, editor of Overview was the first of the contributors, and his remarks are reproduced below.

SHAW:

> I'm always impressed in a conference of higher education how quickly we forget that which is supposed to characterize those devoted to higher education, which is a humility all pervasive in the ability toask the kinds of questions that will reveal important answers, and some acquaintance with the specific or particular field of research which enables us to make at least tentative predictions about the consequence of any course of action. That's an elaborate way of saying that a university is made up of people who have many different kinds of expertness and it seems to me that this problem of distrust of the architect is well-founded occasionally, distrust of the administrators is certainly well-founded occasionally, distrust of the faculty, distrust of the man who is going to tell us what we're going to do in the colleges over the state. All of these distrusts are based, it seems to me at least, on a failure to distinguish between the kinds of expertness that are necessary in the total to produce a college or university, a good building, or anything else. We know a little bit about people and their characteristics. My guess is that the administrators perhaps are a little more expert at this than the architect but neither is especially expert. We know something about the objectives and goals of our education, and my guess is that the faculty,the students, some cross-section or representation of the community or society are the experts whom we must consult to get this kind of information. We know something about climate; we know something about on the average how much snow and how much rain to expect, but again there are experts in this field whom we should consult and whose expertness we should take advantage of. We know that in constructing a campus or any part of it, the climate in a broad physical or meterological sense is one kind of a climate, but there is a community climate or environment to which we pay some attention, which quite often extends beyond the stone wall and occasionally demonstrates a blending in, a blurring of the two. This kind ofclimate is part of the city planners, or planners field of expertness. Feature the climate of East Lansing and Lansing in which this huge institution exists. There are people with expertness in the development of this climate.
>
> The relationships too, --these are things which

SHAW: (Continued)

seem to me expertnesses which have to go into the planning of a building-the relationships which are internal. Now, I'm using this term to cover a great many things--the relationships between structures, and the people who are guiding the learning and those who are learning, the relationships among the people who are learning, the relationship within, all the relationsnips within the university or college, and then the relationships even without the university. You've got to find people who are expert in these to whom we can toss the ball, who can foresee the consequences of alternate courses of action. When we come to expertness in methods of teaching, whom are we going to consult? Is it the faculty, the present faculty, who are our experts? We're a little bit doubtful about who those are. We don't want to pass this off to a foundation or to a central authority,but here is a field which has tremendous consequences in the development of our plant.

And finally there is the whole question. I mentioned it yesterday and I'm sure I was slightly misunderstood. - the whole question of equipment. Having decided the kind of experience needed and the ways we bring learners and teachers together and the guides for learning together, what can we look forward to in the development of equipment which makes more meaningful the learning experiences? I wasn't just thinking of this purely old-fashioned device which we're using now. (reference to the closed circuit T.V. used during the conference...Editor). I was thinking of the devices yet untold. Just the other day I was in a place where they had a six piece screen and by pre-programming, you could get film strips, slides, overhead projectors, T.V., not on one of these little 21 inch things, but T.V. on a 3' by 5' screen, motion picture clips, and so on. This is only the beginning. We have no real experts in this field but I've seen two or three universities now which have actually engaged people who are thinking about the future of educational equipment.

My main point is that it seems to me one of the principal causes for this distrust - and by the way I'd like to say in fairness to the architects, I've seen at least as many monuments to educational administrators as I have to architects on campuses - but it seems to me that our principal job is to discern the areas in which expertness has a part to play and then do that most difficult of all things, take action. This is the process which consciously says here is as much as we know now, we've got to be careful, but we've got to act and to act on the basis of the maximum

SHAW: (Continued)

> knowledge we have now while maintaining the possibility of altering that action in years to come.
>
> It's quite a sermon and Ireally didn't come here to preach a sermon. It bothers me though, that we have evidence of distrust, material distrust, and we're going to have it until all of us begin to analyze and to say what we're equipped to do, to analyze the roles that experts can plan then look to the experts. Then we won't go to Archie Shaw to ask whether it is better to have a one story building or a five story building, nor to Karl Hereford and say how much snow do you expect you're going to get. Rather let's accumulate the expert information, let's ask the important questions and then having asked them let's answer them for the time being, because at some point we have to act while maintaining an open mind as to the future developments.

Dr. Shaw's remarks were well received by the members of the conference. Several further pertinent comments enlarged upon Shaw's statement. An eloquent plea for recognizing the expertness of the faculty was entered by Dr.E.Burrows Smith, Wayne State University.

SMITH:

> I would like to agree with everything that Mr. Shaw has said and enter a plea for the expertness of the faculty which has been largely over-looked. When the administrator identifies the people who are experts it seems to me he makes a great mistake if he leaves out the faculty who are going to use the facilities. It's been said that educational people are poor clients because they're inarticulate about what they want. I suspect this is quite false. I think the average faculty member is extremely articulate and knows exactly what he wants. There are two factors which keep him from being effective. One is that he's been required to make-do so often with second best that he's a little bit surprised at the though that he might have something which is best, and if he's told that he can make do with a hundred square feet for an office he's reluctant to ask for a hundred and twenty square feet. This is one factor. The other one, I think is that the administrator tends to say that faculty come and go but we alone know what will be required ten years from now. We alone know whether it is wise to unbolt the seats that were bolted down for the engineers and put in movable seats for the people in the college of education. I would suggest

SMITH (continued)

> that probably the faculty members can make at least as sound a prediction of what will be required in ten or fifteen years as the administrator. Therefore, I will simply make this urgent plea that when the administrator consults with the many experts, including the architects,he not ignore the greatest experts who are right at hand.

Parker called upon Dr. Floyd Reeves for comments and observations after discussion of Shaw's remarks was completed. Dr. Reeves is well-known as a student of higher education and administration, and has made many significant contributions during the past four decades. He pointed out another area of expertness that had been over look by members of the conference.

REEVES:

> I agree with most of what Dr. Shaw said but not all of it. I agree with most of what Mr. Smith from Wayne said, but not all of it. It seems to me that it's about time that somebody at least mentions one of the two major groups who are concerned with these buildings and the campuses and the walks. The university in its better sense is a community of scholars and prospective scholars working together -- a community of scholars if you want to put it that way, -- and I'm a little bit interested in this thing that's being referred to as a decision process and who participates in it. I go a long way with Mr. Shaw on that but he forgot the people who are going to sit in these seats or sit on the stools or stroll around the campus. A great majority of those who engage in this learning process for which the institution exists happen to be the students. I just want to point out that I figure the basic principle that you're almost getting at this morning, getting at it better than I have heard it done anywhere else before, but not quite hitting the center of it, is this: in the planning process that culminates in the final decision, all the students should participate to the extent of knowledge which they possess. I do not divide these people into experts and non-experts. They're all experts on something. The people who sit in the seats are more expert than those who stand on the platform and talk to them with reference to the comfort of those seats. Thank you.

Parker, as Chairman, followed Dr. Reeves's comments by calling upon each panel member to review and summarize the lengthy discussion from his own point of view. Excerpts from their concluding statements provide a substantial summary of the essence of the morning's reactions.

HENGST:

> It seems to me that if we are going to be involved in the development of facilities, completely new campuses, one thing we need to keep in mind is that we must plan for maximum individual development. It appears to me that the results of this planning activity need not be concerned specifically with a facility or with a campus, need not be based specifically on a program, any of which would serve as ideals but rather that this planning need serve only one thing. The development of the people who are involved in the situation and those who will be involved in the results of the plan is the real function of such activity.

SMITH:

> I think that the main point as I see it is that the only purpose of any of this discussion is our concern with the learning process. As we face an increasing problem of providing facilities to house this learning process at the higher education level. I hope that what we're doing here in these two days is more than isolated intellectual criticism. I hope this. and future meetings of this nature. result in tangible benefits.

DAHNKE:

> It seems to me we have to add up many factors and we have to start with educational objectives and figure out what this means in terms of curriculum. We have to examine these implications. It seems to me of all the groups concerned-and I agree that students and as a matter of fact, alumni. ought to be involved in this - the faculty is in the best position to make this examination. I think this is so because after having added up all of the dollars and the space that we're going to need. and all of the gimmicks that we can think of including closed circuit T.V., that after we've added all these up, we're still going to woefully short. Ultimately then. the solution to this problem is going to be beyond everything we can do in the way of space utilization It's going to require some real work

DAHNKE: (Continued)

on the part of those who teach in terms of how they can handle more students with not as much additional space as they would like, nor as many operating dollars as we would like them to have.

HEREFORD:

I would hope that we would not settle for the adding up of expertness so much as to concentrate on finding ways of working together that will challenge us all to exceed our limits of expertness. This to me is the real challenge and opportunity that is provided either in the planning of an individual facility or participating in small and large ways in the design of a community or a large university campus. It's this opportunity for each of us to stretch ourselves that really excites me. So when we take these opportunities and put dollar signs on them or put them in terms of efficiency, I think we really lose the essence of the opportunity and the challenge that's offered to us in higher education, and that is for each of us to use these opportunities to stretch ourselves beyond our present limitations.

BRUBAKER:

I would like to say that the last time I was here on this campus just briefly to get some things over at the College of Education, my wife was along. I dropped her off here, at the Kellogg Center and when I came back she was sitting over here along this beautiful little creek and she said that in that hour she had really been most comfortable and she felt very kindly towards the campus. She thought it was one of the finest places she'd ever seen. I think Michigan State University needs our thanks for providing this spot which I feel is a good example of some of the things we've talked about. The building isn't quite as important here as the stuff that goes around outside the building. There are some beautiful outside spaces around here which makes this a nice place to be

PARKER:

As your chairman, I have been asked to summarize. In view of the fact that our discussion has been so well summarized not only by the panel but by Dr. Reeves, Dr. Shaw and others, anything that I could add would seem superficial. We have examined the role of the architect, the inadequacies of our own educational planning, the involvement of the faculty and the

PARKER: (continued)

students--in fact, elements of the whole planning process. I would like to add one comment. I hope that we will not allow the opportunity to use these planning activities wisely slip through our fingers. I'm confident that the real answer lies in getting together as we are today. Each of us will need to return to our own institutions and through the leadership there develop the planning process which best fits each situation. I am sure that one of us came here hoping to carry home a package plan. If we did we are mistaken. But we have considered the pertinent elements of planning which can be most useful to each of us. I want to take the opportunity to thank the panel, and Mr. Brubaker.

RETROSPECT AND PROSPECT IN THE PLANNING OF INSTRUCTIONAL FACILITIES IN INSTITUTIONS OF HIGHER EDUCATION

Karl Hereford

It's always flattering for a young person such as myself to be asked to address even in a humble way such an august gathering as this. I appreciate the opportunity, indeed. If you will, I wish you would interpret my remarks, then, since many of them will be somewhat repetitive of the things you've already considered. in the way of a summary, though I am not at all certain that I m the kind of person who can point to directions in which you should go or that you will go. So, if you'll bear with me I will just share some convictions which I feel rather deeply.

Basic Issues in Higher Education

It seems to me that the primary issues in higher education deal with people and not with buildings. To me this is basic. and we can justify our concern here, and the conferences all over America of this type, with problems of building utilization and expansion because college buildings directly and markedly affect the way we teach. the way we communicate one with another, and the ways we have open to us to learn. There is no question that we have a building problem in higher education, and more efficient use must be made of those existing facilities which are adequate to the changing demands of education. Those which are not so adequate must be renovated or destroyed. There is no question that additional space must be provided for the numbers of new students who will surely descend upon us. These are important and necessary steps to take.

How we go about defining our building problems, however, may be even more important. For example, if we examine our utilization data and define that problem primarily in terms of efficiency of use, we may seek to initiate changes in our customary means of instruction, our traditional schedules for class attendance, our diversity of course and curricular offerings, and in our student-professor ratios. There is little doubt in my mind that many such changes are desirable in and of themselves. But to achieve these outside the context of a developmental plan for the college in all its aspects merely in order to economize on space will surely lead us down the garden path. If we define the problem of expansion in essentially quantitative terms we may well succeed in constructing new facilities but perhaps these buildings will be of a type which make our total developmental problems even more difficult to resolve by willing us a legacy of new well constructed but fairly educationally obsolete facilities. And, as we would all appreciate, once a new building is constructed, good, bad, or indifferent, the challenge to us all, as with the mountain, is to use it regardless of its educational worth. I am confident that we can and will solve the quantity problems in higher education. I share with you, however, a concern that the problems we have be defined in such a way that the action ultimately taken will open up new opportunities and challenges for better teaching, better communications and for better learning.

The Problem

The problem as I see it then is not one of efficiency nor is it simply the acquisition of sufficient dollars to enclose the thousands of new bodies who will occupy our seats of learning. The problem, it seems to me, is to imagine, create, and to provide for faculty and students, the quality of physical environment and atmosphere which will permit and even encourage continual improvement of the educational process. And, if this is the problem then our concern transcends the mechanics involved in the provision and utilization of space and comes to focus upon the nature of the people whose lives and styles of living are affected by these buildings, upon the processes of communication and interaction which lay at the core of instruction and curriculum development, and upon the purposes and ideals of the higher education we purport to serve. If these are our paramount concerns, what is suggested for the future?

Consider, if you will, the prune. I mention the prune primarily because if you will allow me some latitude in my figures, we spend more money in the United States for planning housing for prunes than we do for students in our colleges and universities. And although there is some danger in the use of analogies, perhaps there is something to be gained from an examination of the science of packaging prunes. I am told that prune packing planners start from a wealth of basic information. First of all, and if you will pardon the expression, they know their prunes. Size, texture, pocidity and appearance. They know, also, the kinds of environment, whether enclosed in glass, can, or paper carton, which are best suited to retain those characteristics.

They have as their purpose the clear-cut objective of placing containers of prunes on the pantry shelf of every home in America in an unending stream. By blending these elements of product. environment and purpose, they plan with imagination and intelligence the quality of enclosures which will enhance their product, stimulate its use, and whet the curiosity of the uninitiated. Moreover, through creative artistry they seek through the design of their enclosures to convey something of the integrity of the manufacturer, the consistent quality of the product, and to bestow social prestige and good health upon those who would use the product with regularity.

By contrast, at a time when the whole of science and much of education aims at freeing man from the limitations of physical environment, we have in higher education enslaved ourselves with our own enclosures. For example, many of our classrooms. new and old, do not lend themselves to the use of the multiple instructional techniques employed or attempted to be employed by the various instructors. We refuse to take seriously the devices with known physiological effects related to human performance such as air conditioning. We imitate our predecessors and allow ourselves to be victims of building styles, appealing perhaps to the nostalgic alumni or prejudiced board members but which may have little value for the educational functions which may be carried out by the people who use the building We frequently economize to the point of austerity and take delight. as have become a featish among our counterparts in public schools, in discussing the square foot costs and

and other square foot aspects of environment. We seem to have maximized the importance of buildings as shelter and as external symbols of success and to have minimized the essential importance of buildings as determinants of human behavior. We have too often abdicated the responsibility for educational planning and have left to the architect the prime leadership task of influencing educational programs, which in my mind is our first obligation. In brief, it would seem that by and large we have been more skillful and artistic in our housing of prunes than of people.

If I seem to overstate the current situation it is simply to draw your attention to the challenge of the future. In the coming years, the volume of building in higher education will multiply beyond our wildest expectations. If the mistakes and inadequacies of our past are not to be perpetuated many times over in the years ahead, the educational leadership of our colleges and universities must be brought forcefully to bear upon the planning of instructional facilities.

Objectives of Educational Design

The objectives we seek through the design and use of our instructional facilities is evident. First, we wish to merchandise in appealing fashion the processes, ideals and purposes of our institutions. Second, we certainly wish to see that space is provided which will function gracefully with respect to the educational programs and activities in which our faculty and students are currently engaged. And third, even more importantly, we wish to provide space and an atmosphere which will encourage desired changes in our ways of teaching, communicating and learning. All of these aims are technically and architecturally achievable at a price we can well afford. The artistic tools as Bill Brubaker sowell described this morning are no longer a limiting factor. What seems most urgent then is the development of a new and comprehensive concept of planning college environment, one which brings in association those most creative of our architects and the most imaginative elements of our educational structure.

Major Considerations in Educational Planning

Planning Process. A fine consideration in educational planning is the process itself. One somehow gains the impression that in the planning of many college facilities the plans are based upon the experience of only a few people, the president or his designee,perhaps an interested or powerful board member and an architect. If the problem is one of rennovating an obsolete building the services of the architect might even be eliminated. One also gains the impression that the educators represented in this process have already dissipated much of their energies and imagination in obtaining the necessary funds and authorization to construct the facilities. Consequently, the important end to be achieve is the construction of the facility itself rather than a definition of desired educational environment The experience as sighted yesterday in the Calvin College case study suggests, however, that a more comprehensive campus plan and a more functional and flexible instructional facility result when planning is based upon the experience and judgment of those who will use the facility and becomes in effect, an intensification of the college's over-all instructional program development. It seems to me that we get better educational facilities when as much time is spent in the planning of facilities in educational terms as in architectural. And it seems inconceivable to me that we can plan multi-million dollar buildings and spend endless time and energy on the architectural phase and not spend at least a year, perhaps even two or three in the planning and design of these buildings.

I think also we get better educational facilities when there are ample funds, not only to engage creative architects but to subsidize the work of interested and competent faculty, students, and the services of specialized consultants Actually, the college administrator who fails to involve the faculty and students in planning new instructional facilities is missing what in my mind is one of his finest opportunities to exert an influence for a re-study of the instructional program and for a re-examination of the purposes of the curriculum. No better triggering devise can be invented to help a complacent faculty move forward or to help a dynamic faculty sharpen its concepts of instruction then the task of defining the educational environment in which the instruction takes place.

Planning for Change. A second major consideration in the educational planning of college buildings is the necessity for planners to accept the inevitibility of change. Actually, the nature of planning itself implies dealing with the future. Many of our current instructional facilities give the impression that they were planned with a specific and current program in mind.

Since the facilities will long out-live the persons who planned them, such a limited definition of the planning problem can frequently project the status quo into times and setting in which it may no longer be appropriate. Many devices have been used to assure that desired change in instruction, curriculum and arrangements for learning can take place. One, which seems to underlie the approach taken at Calvin College, is to idealize the kind of program toward which the faculty would see itself striving. The resulting shell of the facilities is designed therefore to accomodate not only the existing program but that which is idealized for the future. The only limitations to this approach would seem to lie in the ability to make their idealizations into realities.

Another approach which I have seen attempted in the design primarily of secondary school buildings is to anchor the designed elements on the key process related to the development of curriculum. The emphasis here falls not so much on the specifics of any particular program or methods of instruction, but upon the best thinking concerning how curriculum changes will be achieved. For example, several years ago the College of Education building, which has been planned here at Michigan State University, came into existance with the full participation of the new faculty members who were persons like myself. We had a limited curriculum so that one of our basic concerns was how to take such a heterogenous, young, and devoted staff and assist them through the design of the facility to develop curricula. So, we made several assumptions. The first was that each faculty member is in and of himself valuable and private. So we had designed for each of these persons a little office. Second, we noted in our naive way that there was a propensity of persons who were isolated in cells of this sort to be inadequate social mixers or social inter-actors. Somehow we felt that in the process of curriculum development it would be necessary for us to spend endless hours over long periods of time arriving, through a sharing of ideas and through compromises, to fashion something called a curriculum.

The thing which we ultimately tried to do was fairly simple. We simply grouped these individual offices in a fairly old-fashioned way around some open areas without corridors which we called planning areas. And then we had a place for faculty members whose interest areas or professional interest were compatible. Then we tried to place one in relation to the other in such a way that the inter-action tended to be informal rather than formal. So we placed little pieces of glass in each of these faculty offices so that each would be aware, so to speak, of the presence of the other without having his own privacy violated. Now, whether this is good practice or not remains to be seen. If anything, this has been a very excellent social space. The inter-actions which we had hoped to achieve and on which this kind of scheme was based have taken place. In fact, at periods we begin to wonder if the sanctity of these individual offices can be preserved with as much inter-action as we have fostered. But here was an attempt, admittedly a crude one, to design not around a program but around a set of processes which we hoped through the inter-action of people in desirable ways would help in not only one curriculum but a continous stream of curricula. Whatever approach is taken, it is clear in my mind that the persons involved in planning must consider the needs of the occupants twenty, fifty, or even one hundred years hence, as well as those which are immediate and important to them.

Planning for Programs, Not Dollars. A third major concern in educational planning is the development of a splendid ability to thwart the inevitable attempts to economize. Ralph Calder, the architect for several of the projects at Michigan State University has what I believe to be a perfectly realistic attitude toward economy. He says, "No one asks me five years after the building is completed how much it cost, only how good a building it is." I suppose that we have gotten into as much trouble as anything in the planning of instructional facilities in our attempts to cut costs or to get something for nothing--compromising good planning to the architectural whims of a would-be donor, relying unduly on the testimony of so-called building experts, attempting to shave the commissions of qualified architects or to accept the volunteer services of an architect who may be known by a member of the board but who offers no special competence or experience in the educational field.

Large universities, it seems to me, are as susceptible to economizing as small colleges Frequently, many projects are given tothe same architectural firm with the unlikely prospect that the creativity brought to the last project will equal that of the first. Equally threatening to the development of educationally adequate facilities is the practice of the stock plan or the standard set of specifications. Compromising good construction materials in order to cut initial costs can and will obviously mitigate against the economical, long-term use of the facilities. But the most important and significant cost of economizing. it seem to me, is the effect it has upon the planners themselves. Somehow, with money as the senior partner in the planning process our attempts to create, invent. and to achieve desirable new departures in educational environment become thwarted. I remember reading not too long ago in "American Heritage" a famous statement by Mr. Carnegie. He said. "Pioneering don't pay." Then he went to Europe and saw a blast furnace and came back and established the worlds most fabulous steel empire. It has always seemed wisest to me to plan first what an educational environment ought to be and then compromise reluctantly from that position. The alternative of identifying first what we can have with the dollars available and then seeking to test our ingenuity in making-do with the facilities. seems a curious position to take for a profession with its eyes on the future.

Probably one of the most difficult decisions we have to make is whether to abandon an older structure or to seek to rehabilitate it for an additional ten to thirty years use. The decision must. as with new facilities. be based upon its potential educational adequacies. The urge to economize in such a decision can have its long term effects To illustrate. I am reminded of the observations of one our leading city planners whose clean-up, patch-up, fix-up programs in the city won awards year after year. After ten years, he concluded regarding the slum areas of his city that he had the best painted, best patched-up and fixed-up slums in America.

Human Values and Planning. The final consideration I should like to emphasize for planning is one which goes beyond the mere functionality of the buildings. It has occurred to many people and it has been stated here frequently that the enduring quality of our best educational facilities are not the elements of flexibility, adaptablity, and expansibility themselves, but rather those qualities of the environment which give emphasis to and dignify the human values in our society. In this sense, the architecture which encloses our educational programs and activities actually communicates something of the spirit and the purpose of the institution. It highlights the importance of people as individuals whether student or faculty, and it argues persuasively in its scale, its form, its texture, its contrast, and in its plan against the institutionalization of education. Human values are more easily illustrated than measured For example an experiment with students at Michigan State - regardless of their age, sex, major area of study, and so on - indicated that these students were able to describe the differences between classrooms, corridors, auditorium and library facilities found on this campus in words which denote human and non-human values For example, words such as flexible, friendly, relaxed, stimulating, varied, residential, human, good, and informal were used to describe spaces in which these people perceive the atmosphere to be consistent with their own human values. Words such as inflexible, factory-like, business-like, institutional. formal, depressing, non-human, were used to describe equally spacious, accessable and costly spaces which they perceived to be inconsistent with their own values. It would seem to me. therefore, that such human values must take ascendency in our educational planning.

Conclusion

As a minimum, it would seem that the planning for instructional facilities in which student and faculty will be housed over long periods of time, should provide first for freedom of movement to minimize the needless problems of student traffic and the necessity for extensive rules and regulations governing human behavior. Second, it should provide for individual home bases for faculty members free of accoustical and other types of interference. Third, it should provide a psycologically satisfying home place for each student whether in the dormitory or in a classroom facility. Fourth, it should provide the kinds of group interaction spaces whether they are called classrooms, conference room. or studios, which will minimize the normal wear and tear occasioned by the necessary inter-action of people.

These of course, are merely one man's notions of planning. Each college. in my opinion, must plan its own facilities in ways consistent with its own sub-culture. The future of higher education and the future of educational architecture, I believe, however are inseparable. The challenge to college administrators, as

I would see it, is to breathe into our instructional facilities, through imaginative educational planning, the spirit of liberation, the feeling for the primacy of individuals and the lightning receptivity to new ideas which characterizes the best we know in higher education.

APPENDICES

ATTENDANCE LIST

CONFERENCE ON

PLANNING AND USE OF INSTRUCTIONAL FACILITIES
August 8-9, 1960

REGISTRANTS

Amundson, Robert H.	Department of Sociology	Loretto Heights College Loretto, Colorado
Barrett, Laurence	Academic Dean	Kalamazoo College Kalamazoo, Michigan
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Primm, James N.	Dean of the College	Hiram College Hiram, Ohio
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Sister Eileen	Dean	College of St. Theresa Kansas City, Missouri
Sister M. Claudia, I.H.M.	Librarian	Marygrove College Detroit 21, Michigan
Sister Miriam Fidelis	Dir.of Admissions & Registrations	Marygrove College Detroit 21, Michigan
Sister Mary Amatora, O.S.F.	Prof. of Ed. & Psychology	St. Francis College Fort Wayne, Indiana
Sister Mary Lucille, R.S.M.	President	Mercy College Detroit 19, Michigan
Smith, Dr. E. Burrows	Assis. to the Vice Pres.	Wayne State University Detroit 2, Michigan
Smith, Kenneth P.	Dean	Sterling College Sterling, Kansas
Smith, W. Ed	Business Manager	Monmouth College Monmouth, Illinois
Smythe, Deward W.	Comptroller	DePauw University Greencastle, Indiana
Snowbarger, Willis	Dean	Olivet Nazarene College Kankakee, Illinois
Spindler, Robert H.	Administrative Assis.	Central Michigan University Mt. Pleasant, Michigan
Stevens, Harold R.	Assis. to the President	Baldwin-Wallace College Berea, Ohio
Stickler, W. Hugh	Dir., Institutional Research & Service	Florida State University Tallahassee, Florida
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Wickham, Terry	President	Heidelberg College Tiffin, Ohio
Wilburn, D. Banks	Dean of Teachers College	Marshall College Huntington, West Virginia
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PROGRAM PERSONNEL

MSU

Cherney, Sheldon	Continuing Education Service
Dahnke, Harold	Office of Institutional Research
Hengst, Herbert	Administrative and Educational Services
Hereford, Karl T.	Administrative and Educational Services
Jamrich, John X.	Center for the Study of Higher Education
Lautner, Harold W.	Urban Planning and Landscape Architecture
Parker, Floyd G.	Administrative and Educational Services
Prochaska, Joseph	Urban Planning and Landscape Architecture

Off Campus

Brubaker, Charles W.	Architect	Perkins and Will 309 West Jackson Blvd. Chicago 6, Illinois
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GUESTS

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Cassell, John	Administrative and Educational Services
Friedman, Burt	Administrative and Educational Services
Hatton, Robert	Administrative and Educational Services
McCall, Harlan	Administrative and Educational Services
Miller, James W.	

MSU Guests (continued)

Reeves, Floyd	Consultant to President

SUMMARY

Registrants	86
Program Personnel	
MSU	8
Off Campus	6
Guests	
MSU	7
Off Campus	5
Total	112

PLANNING AND UTILIZATION CONFERENCE

Purpose: To focus careful attention on the variety of problems confronting colleges and universities in the field of planning and use of instructional facilities

PROGRAM:

Monday, August 8

Morning:

8:30 Registration - Kellogg Center Main Lobby
Coffee - Centennial Room

9:30 First General Session - 103 A & B

Presiding: John X. Jamrich, Director, Center for the Study of Higher Education, Michigan State University

Topic: "The Overall Problems of Use and Planning of College and University Instructional Facilities"

Speaker: John Dale Russell, Director, Institutional Research, New York University

10:30 Topic: The Michigan State University--Educational Facilities Laboratories Inc. Study of Instructional Facilities

Speaker: John X. Jamrich, Director. Center for the Study of Higher Education, Michigan State University

12:00 Luncheon - Red Cedar Rooms

Afternoon:

1:30 Second General Session - 103 A & B

Presiding: Karl T. Hereford, Associate Professor, Administrative and Educational Services, Michigan State University

Topic: "Present and Future Facility Needs - National Picture"

Speaker: John B. Rork, Specialist, Campus Planning, U. S. Office of Education

3:00 Topic: "Factors in Long Term Institutional Planning"

Speaker: Elwin W. Stevens, Assistant to the Vice President for Planning and Development, State University of New York

6:00 Dinner - Red Cedar Rooms

Evening:

8:00 Third General Session - Kiva, College of Education

Presiding: Herbert Hengst, Administrative and Educational Services, Michigan State University

Topic: Campus Planning

Speakers: Harold W. Lautner, Head of Urban Planning and Landscape Architecture; Campus Landscape Architect, Michigan State University
Henry DeWit, Business Manager, Calvin College

Tuesday, August 9

Morning:

9:00 Fourth General Session - 103 A & B

Presiding: Floyd G. Parker, Associate Professor, Administrative and Educational Services, Michigan State University

Topic: "The Function of Architecture in Higher Education"

Speaker: Mr. Phillip Will, Jr., Partner, Perkins and Will, Chicago, Illinois

10:00 Coffee - Centennial Room

10:30 Reacting Panel

Bruce Smith, Partner, Smith and Smith Birmingham, Michigan
Harold Dahnke, Associate Professor of Education, Office of Institutional Research, Michigan State University
Karl Hereford, Associate Professor, Administrative and Educational Services, Michigan State University
Herbert Hengst, Administrative and Educational services, Michigan State University

12:00 Luncheon - Red Cedar Rooms

Afternoon:

1:30 Fifth General Session

Presiding: John X. Jamrich, Director, Center for the Study of Higher Education, Michigan State University

Topic: "Retrospect and Prospect in the Planning of Instructional Facilities for Institutions of Higher Education"

Speaker: Karl Hereford, Associate Professor, Administrative and Educational Services, Michigan State University.

3:00 Tour of MSU Campus - (Initiating from front of the Kellogg Center for Continuing Education)

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